1996 Fare-Mix Study

MBTA Heavy Rail, Light Rail, Bus, and Commuter Rail Service: Average Fares and Ridership

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INTRODUCTION

Since 1981, the MBTA has estimated rapid transit, surface Green Line and bus/trackless trolley ridership levels by dividing the fare revenue collected on each mode by the average fare paid by riders. Total fare revenue by mode is calculated on an ongoing basis by the MBTA's Revenue Audit Department, while average fares are determined through periodic "fare-mix" studies.[1] In this study, a portion of MBTA ridership is sampled for each mode to determine the proportions of passengers paying the various types of fares. These proportions are then used in conjunction with fare levels to calculate average fares.

This fare-mix report documents the procedures and results of fare-mix surveys conducted in the spring of 1996. The average fares calculated herein will also be used by the MBTA as the basis for generating monthly revenue-based ridership estimates until the next fare-mix analysis.

This fare-mix study introduces a few changes compared to earlier studies. Until now, the MBTA system was divided into rapid transit (Red, Orange, Blue and the subway Green Line), surface Green Line, bus/trackless trolley and commuter rail. In this report, modes will be defined as they are in Section 15 reporting: heavy rail (Red, Orange, Blue), light rail (all Green Line plus Mattapan Trolley), bus/trackless trolley and commuter rail. However, in this study, both the new and the old modal divisions will be reported to allow for comparison. Additionally, instead of the "Average Cash & Token Fare," which is not calculated anymore, two new figures are estimated in order to take into account monthly pass usage: true average fare and average pass ride value.

[1]Prior fare-mix studies were conducted in 1981, 1982, 1983, 1984, 1985 (CTPS Technical Reports 39, 43, 48, 55 and 57), 1989 *(1989 MBTA Fare-Mix Study)* and 1992 *(1992 MBTA Fare-Mix Study)*.

SUMMARY OF RESULTS

Between 1992 and 1996, weekly passenger boardings decreased on the bus system, stayed relatively stable on rapid transit and the surface Green Line and increased on commuter rail, resulting in a slight decline in ridership for the system as a whole. The average farebox deposit rose on rapid transit and the surface Green Line but dropped on commuter rail and the bus system. Systemwide revenue rose between 1992 and 1996, and increased on every mode except bus.

Average Fares

Table 1-1 exhibits average farebox deposit, true average fare and average pass ride value for weekdays and the weekend combined, and Table 1-2 shows the average farebox deposit for weekdays and the weekend separately. Average farebox deposit is the ratio of farebox revenue to all passengers, including those using a monthly pass. The true average fare is the ratio of all revenue, including pass revenue, to all passengers. (True average fare is not available for weekdays and weekends separately because of the lack of detailed revenue data.) The average pass ride value is the ratio of pass revenue to total trips for which a pass was used.

The 1996 values are compared to the *1992 Fare-Mix Study* results ("April 1992") and to the results generated by Peter G. Furth[2] ("Furth Analysis 1992"). For rapid transit, *1992 Fare-Mix Study* figures were not weighted. Thus, in the 1996 analysis, both an unweighted figure (for reasons of comparison to 1992) and a figure weighted by the total numbers of heavy rail and light rail passengers (i.e., subway Green Line) were computed. There is virtually no difference between the unweighted and weighted results with the exception that the weighted figures have a better precision.

From 1992 to 1996, the average farebox deposit for rapid transit increased on weekdays and decreased slightly on the weekend, resulting in an overall increase. The average fare for the Green Line increased slightly in this time period, reflecting a small increase in the weekday average fare. For the bus system, the average farebox deposit decreased, because more passengers used a pass. The same trend is visible for commuter rail between 1993 and 1996. For the whole system without commuter rail (also known as the core system), the average farebox deposit increased by 4.3% over the last four years. In 1996, the systemwide average fare, including commuter rail, was $0.766.

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[2]Published in the *MBTA Supplemental Draft Environmental Impact Report on the 1991 Fare Increase*.

Table 1-1
Average Farebox Deposit, True Average Fare and Average Pass Ride Value by Mode for Weekdays and the Weekend Combined in Dollars

	Spring 1996	April 1992	Furth Analysis 1992
Rapid Transit			
Avg. Farebox Dep. (unwght.)	**0.478** (10.9%)	0.432	0.444 (12.8%)
Avg. Farebox Dep. (wght.)	**0.477** (10.6%)	—	
Heavy Rail System			
Average Farebox Deposit	**0.463** (12.4%)	—	—
True Average Fare	**0.815**	—	
Average Pass Ride Value	**0.828**	—	
Surface Green Line			
Average Farebox Deposit	**0.322** (4.5%)	0.312	—
Light Rail System			
Average Farebox Deposit	**0.413** (7.0%)	—	—
True Average Fare	**0.602**	—	
Average Pass Ride Value	**0.691**[3]	—	
Bus			
Average Farebox Deposit	**0.249** (10.4%)	0.263	0.263 (4.6%)
True Average Fare	**0.445**	—	
Average Pass Ride Value	**0.489**	—	
Core System			
Average Farebox Deposit	**0.361**	0.346	—
True Average Fare	**0.612**	—	
Average Pass Ride Value	**0.639**	—	
Commuter Rail System			
Average Farebox Deposit	**1.062**	1.081[4]	—
True Average Fare	**2.386**	2.161	
Average Pass Ride Value	**1.899**	1.825	
Total System			
True Average Fare	**0.766**	—	—

(Note: Numbers in parentheses are the precision figures at the 95% confidence level.)

[3]This figure excludes free outbound surface stop trips.

[4]This figure is for 1993, since the equivalent commuter rail data are not available for 1992.

Table 1-2
Average Farebox Deposit by Mode for Weekdays and the Weekend in Dollars

		Spring 1996	April 1992	Furth Analysis 1992
Weekday:	**Rapid Transit**			
	unweighted	**0.481** (12.5%)	0.421	0.437 (14.6%)
	weighted	**0.481** (11.9%)		
	Heavy Rail System	**0.464** (14.1%)	—	—
	Surface Green Line	**0.307** (5.2%)	0.298	0.289 (7.3%)
	Light Rail System	**0.412** (7.9%)	—	—
	Bus	**0.249** (12.1%)	0.261	0.261 (4.8%)
	Commuter Rail	**0.921**	0.948[5]	—
Weekend:	**Rapid Transit**			
	unweighted	**0.460** (12.0%)	0.503	0.508 (18.8%)
	weighted	**0.460** (12.0%)		
	Heavy Rail System	**0.460** (11.0%)	—	—
	Surface Green Line	**0.380** (8.8%)	0.384	—
	Light Rail System	**0.415** (14.3%)	—	—
	Bus	**0.253** (19.1%)	0.277	0.277 (17.6%)
	Commuter Rail	**2.398**	2.429[5]	—

(Note: Numbers in parentheses are the precision figures at the 95% confidence level.)

Revenue

Weekly revenue figures are given in Table 1-3. Total revenue for the core system (the whole system, except commuter rail), including both farebox revenue and pass revenue, was 11% higher in 1996 than in 1992. The farebox revenue increased by only 3.2%, but the pass sales revenue rose by 24.6%. In 1996, pass revenue accounted for 41% of total revenue.

[5]This figure is for 1993, since the equivalent commuter rail data are not available for 1992.

Table 1-3
Weekly Revenue from the Farebox and Pass Sales by Mode

	Spring 1996	April 1992
Rapid Transit		
Farebox Revenue	**$986,595**	$894,409
Heavy Rail System		
Farebox Revenue	**$769,100**	—
Pass Sales Revenue	**$583,014**	—
Surface Green Line		
Farebox Revenue	**$174,079**	$166,018
Light Rail System		
Farebox Revenue	**$391,574**	—
Pass Sales Revenue	**$179,347**	—
Bus		
Farebox Revenue	**$461,682**	$512,160
Pass Sales Revenue	**$363,485**	—
Core System	**$2,748,202**	$2,476,187
Farebox Revenue	**$1,622,356**	$1,572,587
Pass Sales Revenue	**$1,125,846**	$903,600
Commuter Rail	**$1,018,994**	$865,983[6]
Farebox Revenue	**$453,506**	$433,264[6]
Pass Sales Revenue	**$565,488**	$432,719[6]
Total System	**$3,767,196**	—

Ridership

Table 1-4 shows the number of weekly passenger boardings by mode, and Table 1-5 breaks down the 1996 boardings by fare category. Altogether, in 1996 the MBTA had over 4.9 million weekly boardings. Between 1992 and 1996, total boardings for the core system were essentially unchanged. Rapid transit boardings increased by 2.6%, while the surface Green Line stayed stable. The

[6]This figure is for 1993, since the equivalent commuter rail data are not available for 1992.

Table 1-4
Weekly Passenger Boardings by Mode

	Spring 1996	April 1992[7]
Rapid Transit		
Unweighted	**2,064,196**	2,069,764
Weighted	**2,067,637**	2,014,435[8]
Heavy Rail System	**1,659,533**	—
Surface Green Line	**539,995**	531,473
Mattapan High Speed Line	30,500[9]	—
Light Rail System	**978,599**	—
Bus	**1,853,128**	1,950,806
Core System	**4,491,260**	—
Excl. Mattapan	4,460,760	4,496,714[10]
Commuter Rail	**427,133**	400,760[11]
Total System	**4,918,393**	—
Excl. Mattapan HSL	4,887,893	—

bus system exhibited a significant drop (5%), continuing a long-standing trend of declining ridership. Total commuter rail boardings, however, increased from 1993 to 1996 by 6.6%. In 1996, the bus system moved the most passengers (1.85 million per week), followed by heavy rail (1.66 million per week), light rail (0.98 million per week) and commuter rail (0.43 million per week). In 1996, most passengers on the core system paid adult cash fares (43.8%) and 39.5% of the riders used a monthly pass. The monthly pass was the most common fare category on commuter rail (60.2%), the surface Green Line (32.6%) and bus system (40.1%).

[7]All 1992 passenger boarding figures exclude Mattapan High Speed Line.

[8]Derived from P. Furth's 1992 average farebox deposit figure, which corrected for the error causing rapid transit ridership in the 1992 Fare-Mix Study to be too high (see pp. 33-34).

[9]The Mattapan High Speed Line figure is based on a 1995 passenger count.

[10]This figure is the sum of bus, surface Green Line and the weighted value for rapid transit.

[11]This figure is for 1993, since the equivalent commuter rail data are not available for 1992.

Table 1-5
Weekly Passenger Boardings in Spring 1996 by Fare Category by Mode (without Mattapan HSL)[12]

	Passenger Boardings	Adult Cash	Adult Pass	Sen. Cit. & Disabled	Child Half	Stud. Pass	Free	Other
RT Weighted	**2,067,637**	1,072,071 (51.9%)	840,494 (40.7%)	72,367 (3.5%)	26,879 (1.3%)	33,082 (1.6%)	22,744 (1.1%)	— —
Surface Green Line	**539,995**	163,417 (30.3%)	175,857 (32.6%)	21,600 (4.0%)	5,400 (1.0%)	6,480 (1.2%)	166,117 (30.8%)	1,014 (0.2%)
Heavy Rail System	**1,659,533**	819,809 (49.4%)	705,302 (42.5%)	64,722 (3.9%)	21,574 (1.3%)	31,531 (1.9%)	16,595 (1.0%)	— —
Light Rail System	**948,099**	416,758 (44.0%)	312,467 (33.0%)	29,391 (3.1%)	9,481 (1.0%)	7,585 (0.8%)	171,403 (18.1%)	1,014 (0.1%)
Bus System	**1,853,128**	719,014 (38.8%)	743,104 (40.1%)	127,866 (6.9%)	75,978 (4.1%)	107,481 (5.8%)	79,685 (4.3%)	— —
Core System	**4,460,760**	1,955,581 (43.8%)	1,760,873 (39.5%)	221,979 (5.0%)	107,033 (2.4%)	146,597 (3.3%)	267,683 (6.0%)	1,014 (0.0%)
Commuter Rail	**427,133**	148,642 (34.8%)	257,134 (60.2%)	12,814 (3.0%)	5,126 (1.2%)	— —	3,417 (0.8%)	— —

[12] Numbers might not add up do to rounding.

2. Description of MBTA Service and Ridership Classification

The MBTA operates a system of five rapid transit and light rail lines, 11 commuter rail lines, 159 bus routes, and four trackless trolley routes. The MBTA also provides for the operation of three commuter boat routes. Specialized accessible transportation is provided in 51 cities and towns, and the MBTA subsidizes private bus service provided by seven companies and suburban bus service operated in 10 towns.

This study focuses on ridership on the MBTA's rapid transit, surface Green Line, bus/trackless trolley, and commuter rail services.[12] These services, and the classifications of riders on these services, are described below.

DESCRIPTION OF SERVICE

Heavy and Light Rail

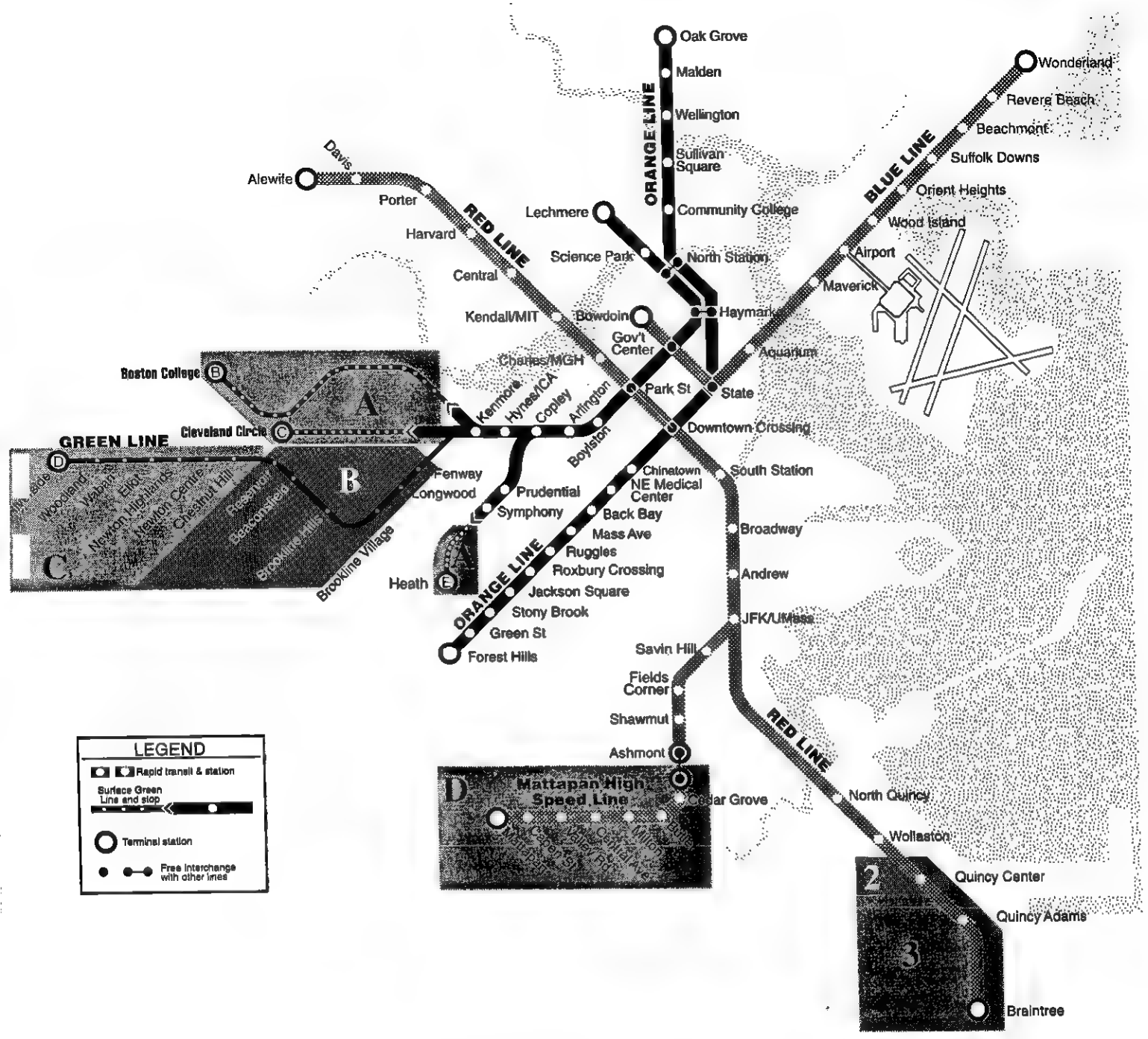
The MBTA heavy and light rail system is comprised of five lines, including 60 stations and 65 surface stops: the Red Line, the Orange Line, the Blue Line, the Green Line, and the Mattapan High Speed Line (see Figure 2-1).

Red Line: The Red Line is 20.5 miles long. There are twenty-two stations on the Red Line, 16 of which are accessible for persons with disabilities. There are two branches, with service running between Alewife Station in North Cambridge and Ashmont Station in Dorchester or Braintree Station in Braintree. All service operates along a common alignment between Alewife and the JFK/UMass Station in Dorchester, at which point service branches off to either Ashmont or Braintree. Throughout most of the day, service is split equally between the two branches.

For fare purposes, most of the Red Line is in Zone 1. The exceptions are Quincy Center, which is in Zone 2, and Quincy Adams and Braintree, which are in Zone 3. Riders entering Zone 2 and 3 stations pay twice the base fare

[12]Ridership data for the commuter boat lines are generated from other sources.

Figure 2-1
Rapid Transit and Surface Green Line Map, Fare Zones and Adult Cash Fare



FROM/TO	Zone 1	Zone 2	Zone 3	Zone A	Zone B	Zone C	Zone D
Zone 1	85¢	85¢	$1.70	85¢	85¢	85¢	85¢
Zone 2	$1.70*	----	85¢	$1.70	$1.70	$1.70	$1.70
Zone 3	$1.70*	85¢	85¢	$1.70	$1.70	$1.70	$1.70
Zone A	85¢	85¢	85¢	85¢/free**	85¢	85¢	85¢
Zone B	$1.00	$1.00	$1.85	$1.00	$1.00/free**	free	$1.00
Zone C	$2.00	$2.00	2.85	$2.00	$2.00	$1.00/free**	$2.00
Zone D	85¢	85¢	$1.70	85¢	85¢	85¢	60¢/free***

* *EXCEPT 85¢ TO WOLLASTON AND N. QUINCY*
** *INBOUND/OUTBOUND*
*** *60¢ INBOUND (EXCEPT FREE TO ASHMONT), FREE OUTBOUND.*

(base fare is $0.85), and riders exiting Zone 3 stations also pay an additional base fare. A warrant (good for an $0.85 rebate and/or a free exit) is given to those riders who enter Zone 2 and exit in Zone 3 or vice versa. Commuter rail connects to the Red Line at two stations: Porter Square and South Station.

Orange Line: The Orange Line is 11 miles long and operates between Oak Grove in Malden and Forest Hills in Jamaica Plain. There are 19 stations, 13 of which are accessible for persons with disabilities. The Orange Line includes Boston's newest section of subway —the 4.9 mile section between Forest Hills and Chinatown—which opened in 1987.

All of the Orange Line is in Zone 1 and the base "subway" fare is charged for all trips. Much of the Orange line shares the right-of-way with commuter rail, in the Southwest corridor and along the Haverhill/Reading Line. Connections can be made with commuter rail at North Station and Malden Center on the north side, along with Back Bay/South End, Ruggles and Forest Hills on the south side.

Blue Line: The Blue Line is the shortest of the four subway lines (six miles) and operates between Wonderland Station in Revere and Bowdoin Station in Boston. There are 12 stations, 6 of which are accessible for persons with disabilities. Bowdoin Station, the southern terminus point (just past the Government Center stop), operates only until 5:30 PM Monday through Friday, and is closed on weekends. When Bowdoin is closed, service terminates at Government Center. All the Blue Line is in Zone 1 and the base "subway" fare is charged for all trips. There are no connections with the commuter rail on the Blue Line.

Green Line: The Green Line is the oldest subway line in America and at 25.5 miles, is the longest in total length of the system. It is comprised of three parts; a subway, an elevated, and a surface section and is the most heavily used line in the system. Just a few of the 13 subway stations and the 57 surface stops yet provide access for persons with disabilities. The Green Line has four branches to the west and southwest of downtown Boston: the Boston College branch (B Line), the Cleveland Circle branch (C Line), the Riverside branch (D Line) and the Heath Street branch (E Line). All branches operate to their named terminals. The northern terminus of the Green Line is at Lechmere station in Cambridge, but only Heath Street trains operate that far. Ridership north of downtown Boston is much lower than to the west and southwest, and because of that, Cleveland Circle trains end at North Station, and Boston College and Riverside trains turn around at Government Center.[13]

[13]Construction at North Station, begun in March 1997, has changed the operations of the Green Line branches from the pattern observed during the data collection efforts.

The Central Subway portion of the Green Line (Lechmere-Kenmore/Symphony) is in Zone 1 and the base "subway" fare is charged for all trips. The surface Green Line, which has its own fare structure (described in detail in Chapter 3), currently ranges from free (for outbound surface trips) to $2.00 (Riverside-Chestnut Hill inbound).

On the Green Line, North Station is the only station that connects directly with commuter rail. However, Copley station is only two short blocks from the Back Bay/South End commuter rail station.

Mattapan High Speed Line: The Mattapan High Speed Line operates between Ashmont and Mattapan using PCC light rail vehicles. Although the line is considered an extension of the Red Line in many respects, its vehicles are maintained and operated as part of the Green Line fleet. The line is 2.55 miles long, has eight surface stops, and all outbound travel is free. Passengers who take inbound trips are charged a fare of $0.60 only upon exiting prior to Ashmont. It is assumed that passengers who get off at Ashmont will continue traveling on the Red Line (or get on a bus) and pay the boarding fare there. There are no connections with the commuter rail on the Mattapan High Speed Line.

Bus and Trackless Trolley

The MBTA operates 159 bus routes throughout the MBTA district. There are also four trackless trolley routes serving Cambridge, Watertown and Belmont. Nearly all routes connect with the rapid transit system at least at one location. In areas closer to Boston, bus service generally fills gaps in the rapid transit system (including cross-town service), provides feeder service to rapid transit stations, and provides line haul service in heavily congested areas. Further out, buses provide local service, connections to the rapid transit system, and express service to downtown Boston.

Most bus trips cost only $0.60 (one or two zones). A few routes that cross Route 128 (I-95) have three zones and charge an extra $0.40 for passengers traveling across the highway. Six routes on the North Shore (426, 436, 440/441/442, 450, 400/455 and 468) are zoned-local/express combination routes, and the longer runs require more than $1.00. Express service is considered to be premium service with fares of $1.50 to $2.25.

Commuter Rail

MBTA commuter rail is made up of 11 lines and 102 stations, of which 52 stations are accessible. In total, the network is 288 miles long. The commuter

rail system is split into two sides. The Massachusetts Turnpike can be considered the dividing line between north and south side service.

All north side trips originate from or terminate at North Station, which is served by five lines and 54 stations. Connections can be made to rapid transit at three stations; Porter Square (Red Line), Malden Center (Orange Line) and North Station (Green and Orange Lines). All lines have weekend service at a lower level than weekdays, with the exception of the Ipswich branch which does not run on Sundays.

All south side trips originate from or terminate at South Station, which is served by six lines and 48 stations. In addition, all south side lines except the Fairmount line serve Back Bay Station. On the south side, commuter rail connects with four rapid transit stations: South Station (Red Line) and Back Bay, Ruggles and Forest Hills (Orange Line). On the weekend, only the Franklin line is fully served, the Worcester line runs only to Framingham, and the Attleboro line does not go to Providence, R.I. The Needham line is served only on Saturday, and the Fairmount and Stoughton lines do not have any service on the weekend.

RIDERSHIP CLASSIFICATIONS

Heavy and Light Rail

The Red, Orange and Blue Line are classified as the heavy rail system, while the Green Line and the Mattapan High Speed Line are considered the light rail system. Previous fare-mix studies, such as the one from 1992, distinguish between "rapid transit", including the subway section of the Green Line between Lechmere and Kenmore/Symphony, and "surface Green Line" consisting of the Green Line portion beyond Kenmore and Symphony.

Riders are classified as heavy rail or light rail riders based upon where they enter the system. Those entering the heavy rail portion of the system are classified as heavy rail riders regardless of whether they exit at heavy rail or light rail stations. Conversely, passengers boarding at light rail stops are classified as light rail riders, no matter where they exit.

The fare-mix procedure samples riders at the time that they enter the heavy rail and light rail system and does not track passenger movements within the system. Therefore, figures in this report do not include transfers as separate unlinked trips. At the same time, the figures do not represent complete linked trips because it is not known how many of the trips include transfers to and from the bus system. The rail figures in this report should most accurately be considered simply the number of entries into the heavy rail and light rail systems.

Even though the Green Line was analyzed as part of the light rail system, for data collection purposes, the subway portion was sampled together with the heavy rail system and in the tables is referred to as "Subway Green Line" or "Subw. GL". All heavy rail and subway Green Line stations together are called "Rapid Transit" or "RT".

Bus and Trackless Trolley

For sampling purposes, no distinction was made between local and express bus routes, since revenue is not reported separately, or trackless trolley, since it operates in the same manner using the same fare structure. Average fares, and ridership figures are therefore combined results for all routes and different services.

Commuter Rail

Information on commuter rail ridership was partly derived from a passenger survey and tickets sale figures. This report presents data on average fares, the fare-mix and the number of boardings in a manner similar to rapid transit, surface Green Line and bus. More detailed information is available in a separate CTPS report, the *1993 MBTA Commuter Rail Survey* (March 1995).

3. MBTA Fare Structure

CASH FARES

Adult Fares

The MBTA fare structure is a zone system consisting of a large central zone, and smaller outer zones that differ with each mode of travel. In addition, base and zone fares differ with each mode (see Table 3-1).

Heavy Rail: The heavy rail system is divided into three fare zones (see Figure 2-1). The majority of stations are in Zone 1, which extends eight miles from the core of downtown Boston. For trips within Zone 1, the one-way fare is $0.85. Currently only Quincy Center Station is in Zone 2. Stations farther than nine miles from the core of Boston are in Zone 3. A double fare ($1.70) is collected upon entering stations in Zones 2 and 3, and an additional fare of $0.85 is charged upon exiting stations in Zone 3.

Green Line: The Green Line has four fare zones (see Figure 2-1). The subway section (Lechmere-Kenmore/Symphony) is in Zone 1 and has a base fare of $0.85. The surface Green Line is divided into three fare zones: A, B and C. Zone A contains the B, C, and E Lines. The B Line extends 6.1 miles from the central zone and once on the surface, includes stops from Blandford Street to Boston College in Brighton. The C Line extends 4.8 miles from Park Street and makes all stops between St. Mary's Street and Cleveland Circle. The E Line extends 3.7 miles from the central zone and includes all surface stops from Northeastern through Heath Street in Roxbury. Zone B contains the portion of the D Line which extends 5.3 miles from the central zone and includes all surface stops from Fenway to Reservoir in Brookline. The D Line continues into Zone C which extends 11.6 miles from the central zone, from Chestnut Hill to Riverside. Base fares are $0.85 in Zone A, $1.00 in Zone B, and $2.00 in Zone C. Fares for local trips in Newton (boarding west of Chestnut Hill and alighting no further east than Chestnut Hill) are $1.00. Fares on all surface Green Line service are charged only in the inbound direction; outbound travel is free.

Table 3-1
Rapid Transit and Bus Adult Cash Fares

	One-Way Trip	Round-Trip Based[14]
RAPID TRANSIT		
All Stations on Blue, Green, Orange and Red Lines, excluding Quincy Center, Quincy Adams, Braintree, surface Green Line stops & Mattapan High Speed Trolley	$0.85	$0.85
Quincy Center (Zone 2)	$1.70	$1.275
Quincy Adams & Braintree (Zone 3)		$1.70
Entrance fare	$1.70	
Exit fare	$0.85	
Quincy Center, Quincy Adams & Braintree Local (Zone 2/3)	$0.85[15]	$0.85[15]
Mattapan High Speed Trolley (Zone D)		$0.30[16]
Inbound	$0.60[16]	
Outbound	free	
Surface Green Line		
B, C, & E Lines (Zone A)		
Inbound	$0.85	
Outbound	free	
Surface trips		$0.425
Surface to subway trips		$0.85
D Line		
Inbound Fenway Park - Reservoir (Zone B)	$1.00	$0.925
Inbound Chestnut Hill - Riverside (Zone C)	$2.00	$1.425
Inbound Newton Local (within Zone C)	$1.00[17]	$0.50
Outbound (Zone B and C)	free	
BUS		
Local/Zoned: One or two zones	$0.60	$0.60
Three zones	$1.00	$1.00
Express: Zone 1	$1.50	$1.50
Zone 2	$2.00	$2.00
Zone 3	$2.25	$2.25
Zone 4	$2.50	$2.50

[14]Equivalent one-way cash fare (round-trip cost divided by two).

[15]With warrant. Full fare of $1.70 is charged at boarding station and $0.85 rebate is given at exit station.

[16]Pay fare upon exiting, except for Ashmont, which is free.

[17]With coupon. Coupon is given when exiting inbound trips in Newton and is good for next trip.

Bus and Trackless Trolley: Bus services are priced using a zone system. Bus zones are specific to each route and based upon distance. Local routes up to ten miles (which includes all but 29 routes) are considered to be single zoned routes; fares on these routes are $0.60. Longer routes have multiple zones. The first two zones passed through cost $0.60, while the third zone entered costs an additional $0.40. Fares for express bus service, which operates along I-93, the Mass Pike, and to the North Shore, are between $1.50 and $2.25, depending on the number of zones passed through.

Commuter Rail: Commuter rail cash fares for trips to and from downtown Boston are between $0.85 and $4.75. The first zone traveled costs $1.50 and each additional zone traveled through $0.25 more (see Table 3-3). Interzone fares are not shown in the table.

Special Fares

Reduced fares are available for senior citizens (age 65 and older), persons with disabilities, secondary school students, and children. Discount fares for these groups are generally 50 percent of the cash fare, rounded to the closest nickel. For senior citizens and persons with disabilities, fares are $0.20 for rapid transit and surface Green Line service, and $0.15 for local bus service. For all zoned and express bus trips and commuter rail, the discount is 50 percent. The discount provided other special groups (children age 5-12, and students) is 50 percent for all trips, as well. There are also student passes which are purchased by various school departments. These passes permit unlimited use of the local bus and rapid transit system by students on weekdays until 6:00 PM and cost the school district $11.00 per student and month. Blind people and children under five ride free at all times on all services.

PASS FARES

Adult monthly passes can be used for unlimited travel within the month of purchase for those services on which they are valid. In addition, the face value of passes can be used as partial payment on higher priced transit services, with the rider paying the difference in cash. The exceptions are subway passes which are not valid on buses, and vice versa.[18] Pass price break-even points (which is the number of monthly cash trips required to equal the cost of a monthly pass) are between 16 and 18 round trips, although there are a number of exceptions (see Table 3-2).

[18]Subway passes may be used at certain locations on bus routes 1, 39, 49, and on all of the crosstown CT routes.

Table 3-2
Rapid Transit and Bus Pass Fares

	Pass Type	Cost per Month	Break-Even Point[19]
RAPID TRANSIT			
All Stations on Blue, Green, Orange and Red Lines, excluding Quincy Center, Quincy Adams, Braintree, surface Green Line stops & Mattapan High Speed Trolley	Subway	$27	16
Quincy Center	Combo	$46	18
Quincy Adams & Braintree	Combo Plus	$48	14
Mattapan High Speed Trolley	Bus	$20	33
Surface Green Line			
B, C, & E Lines			
Surface trips	Bus	$20	24
Surface to subway trips	Subway	$27	16
D Line			
Fenway Park-Reservoir			
Surface trips	Bus	$20	20
Surface to subway trips	Subway	$27	15
Chestnut Hill-Riverside			
Surface trips	Bus + $1.00		18
Surface to subway trips	Combo	$46	16
BUS			
Local/Zoned: One or two zones	Bus	$20	17
Three zones	Bus + $0.40		18
Four zones	Bus + $1.40		19
Five zones	Bus + $1.65		19
Express: Zone 1	Combo	$46	15
Zone 2	Zone 1	$64	16
Zone 3	Zone 2	$72	16
Zone 4	Zone 3	$82	16
COMBINED RAPID TRANSIT & BUS TRIPS			
Local Bus to Zone 1 Rapid Transit or surface Green Line, except D Line beyond Reservoir	Combo	$46	16-22
Local Bus to Zone 2 Rapid Transit or all surface Green Line	Combo	$46	8-12
Local Bus to Zone 3 Rapid Transit	Combo Plus	$48	8-10

[19]Number of round-trips.

Bus Pass: A local bus pass is valid for all local bus service, the Mattapan High Speed Line, and the surface Green Line service except Chestnut Hill to Riverside on the D Line. It can also be used as partial payment for service on zoned buses, and the Chestnut Hill to Riverside section of the D Line, with the difference being made up in cash or coupon. The price of this pass is $20, and the break-even point for local bus riders is 17 round trips.

Subway Pass: The subway pass is valid for all Zone 1 rapid transit and Green Line service, and commuter rail service between downtown Boston and Zone 1A and 1B commuter rail stations. It is also valid on bus routes 1, 39, 49 at certain points, and on all of the crosstown CT routes. The price of this pass is $27, having the break-even point at 17 trips.

Combo Pass: The combo pass is valid for all rapid transit service, except Quincy Adams and Braintree, all surface Green Line service, and all local bus service. Bus riders can also use the pass to pay for the first $1.50 of express and zoned bus service. The price of this pass is $46. Since two or more modes may be used in a single commute, the break-even point ranges from 8 to 22 round trips.

Combo Plus Pass: The combo plus pass is valid for all Combo pass service, plus Quincy Adams and Braintree stations. It is also valid for the first $1.70 of express and premium bus route fares. The price of this pass is $48. For Quincy Adams and Braintree pass users the break-even point is 14 round trips. When used in a multi-modal commute, the break-even point ranges from 8 to 10 round-trips.

Commuter Rail Passes: Zone 1 commuter rail pass prices are $64. Commuter rail passes beyond Zone 1 (Zones 2 through 9) cost between $72 and $136. Break-even points for commuter rail trips are in the range of 8 to 17 round trips. Commuter rail 12-ride tickets are priced at the cost of 10 one-way trips (see Table 3-3).

10-Ride Tickets: 10-ride tickets are available in three different denominations for the Green Line and express bus routes: a 10-ride ticket which costs $13.50 for ten $1.50 rides, a 10-ride ticket which costs $17.00 for ten $2.00 rides, and a 10-ride ticket which costs $20.00 for ten $2.25 rides. The $13.50 tickets are valid on "combo-level" express bus routes, such as to Medford, the North Shore as far as Saugus, and all the routes going through Netwon Corner. The $17.00 tickets are valid "Zone 1" express bus routes to Lynn and the Green Line inbound from Riverside, while the $20.00 tickets are valid on "Zone 2" express bus routes to Riverside, Waltham, Burlington, and the North Shore towns Salem, Swampscott, Marblehead, and Nahant.

Table 3-3
Commuter Rail Fares

To/from Boston	One-way Trip	Cost of Pass per Month	Break-even Point[20]
Zone 1A	$0.85	$27.00	8-16
Zone 1B	$1.25	$27.00	7-11
Zone 1	$2.00	$64.00	12-16
Zone 2	$2.25	$72.00	12-16
Zone 3	$2.50	$82.00	13-17
Zone 4	$3.00	$94.00	13-16
Zone 5	$3.25	$104.00	13-16
Zone 6	$3.50	$112.00	13-16
Zone 7	$3.75	$120.00	14-16
Zone 8	$4.00	$128.00	14-16
Zone 9	$4.75	$136.00	13-15

[20]Number of round-trips: the lower bound assumes a transfer to rapid transit, the upper bound assumes no transfers.

4. Methods of Statistical Analysis

Because of the expense and time that is required to count all of the MBTA's riders, system-wide ridership estimates are based upon the total revenue collected by the MBTA and the fare payment characteristics of a sampled portion of MBTA ridership. For each mode, this requires reliable estimates of the average passenger fare, as well as an estimate of the proportion of passengers using each fare category (the "fare-mix"). The estimates of average fares are used in conjunction with revenue figures to determine total ridership by mode. The fare category proportions are then used in conjunction with the total ridership figures to determine the total number of passengers paying each type of fare on each mode.

Fare-mix figures were obtained through a survey which recorded the proportion of passengers by fare category; average fares were obtained by recording the amount of revenue paid divided by the number of passengers. Both types of observations were made for a random sample of heavy rail, light rail, and bus riders. Sampling programs of this type were first instituted by CTPS and the MBTA in 1981; since that time, variations of the sampling program have been used to develop fare-mix information.

Average fares and fare category proportions were obtained for each mode: heavy rail, light rail (with subway and surface Green Line analyzed separately[21]), bus/trackless trolley, and commuter rail. Surface Green Line, bus, and trackless trolley data were obtained by recording the type of fare paid by boarding passengers on the sampled trips, as well as farebox revenue data. Rapid transit data were obtained by recording the fare paid by passengers entering selected subway stations through turnstiles and collector's turnstiles; station farebox data was also recorded. Commuter rail data were not obtained for the *1996 Fare-Mix Study*; they are taken from a 1993 passenger survey. Subsequently, modal ridership estimates were obtained by dividing modal revenue by the respective modal average fare. Systemwide information is obtained by combining the separate modal estimates.

The *1996 Fare-Mix Study* used principally the same method to calculate average fares and ridership as was used in the 1992 study. However,

[21]The reason for a separate surface Green Line analysis in the *1996 Fare-Mix Study* is to be able to compare the data with the figures of the *1992 Fare-Mix Study*.

"Average Cash & Token Fares" were not calculated, because they do not provide important information. Instead the "true average fare", which includes pass revenue, and the "average pass ride value" were estimated for each mode of the transit system: heavy rail (rapid transit and subway Green Line separately), light rail (surface Green Line separately), bus/trackless trolley, and commuter rail. The method used for the 1996 study is as follows:

Average farebox deposit for each system is calculated by dividing sampled farebox revenue by sampled passengers:

$$\text{(1) Average Farebox Deposit} = \frac{\text{Farebox Revenue}}{\text{Number of Passengers}}$$

Total passenger trips can then be estimated by taking the ratio of total cash and token revenue to the average farebox deposit:

$$\text{(2) Total Passenger Trips} = \frac{\text{Total Cash \& Token Revenue}}{\text{Average Farebox Deposit}}$$

Before the true average fare can be computed, it is necessary to

- Determine the usage rate of each system by each pass type, which is the ratio of received value on one system to the received value on all systems for which the pass is valid[22]:

  $$\text{(3) Usage Rate of System } Y_k \text{ by Pass Type } X_i = \frac{\text{Number of Trips per Month on } Y_k \bullet \text{One-way Fare for } Y_k}{\sum \text{Number of Trips on } Y_k \bullet \text{One-way Fare for } Y_k}$$

  In the case that the pass can be used only on one system, the usage rate equals one.

- Distribute the proportion of pass revenue for each pass type to each system, according to the usage rate of the system by pass type:

  $$\text{(4) Pass Revenue of Pass Type } X_i \text{ for System } Y_k = \text{Pass Revenue for } X_i \bullet \text{Usage Rate of } Y_k \text{ by } X_i$$

- Get the total pass revenue for each system, which is the sum of the pass revenues for all different pass types used at each system:

  $$\text{(5) Total Pass Revenue for System } Y_k = \sum \text{Pass Revenue of Pass Type } X_i \text{ for } Y_k$$

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[22]The usage rate for each system by pass type was estimated with data from the *MBTA Systemwide Passenger Survey*.

- Find the total revenue for each system by adding up total pass revenue and total cash and token revenue:

(6) Total Revenue for System Y_k = Total Pass Revenue for Y_k + Total Cash & Token Revenue for Y_k

Finally, the true average fare and the average pass ride value for each system are calculated by dividing total revenue by total passenger trips:

(7) True Average Fare for System Y_k = $\frac{\text{Total Revenue for } Y_k}{\text{Total Passenger Trips on } Y_k}$

(8) Average Pass Ride Value for System Y_k = $\frac{\text{True Avg. Fare - Avg. Farebox Deposit}}{\text{Percent of Passengers Using Pass}}$

An example of the above described method is given in Box 4-1, based on simplified fare-mix figures.

Box 4-1
Example of a Fare-Mix Calculation with Simplified Figures

Fare-Mix Data

BUS:	Cash Riders:	165	(50%)
	Pass Riders:	165	(50%)
	Passengers:	330	
	Farebox Revenues:	$99	
RAIL:	Cash Riders:	300	(66%)
	Pass Riders:	150	(33%)
	Passengers:	450	
	Farebox Revenues:	$180	

Additional Data

One-way Fare for Bus:	$0.60	
One-way Fare for Rail:	$0.85	
Total Farebox Revenues for Bus:	$1,020,000	
Total Farebox Revenues for Rail:	$4,250,000	
Pass Revenue for Bus Pass:	$400,000	($20 per pass)
Pass Revenue for Rail Pass:	$1,620,000	($27 per pass)
Pass Revenue for Combo Pass:	$1,380,000	($46 per pass)
Combo Pass Bus Trips per Month:	30	
Combo Pass Rail Trips per Month:	45	

First the average farebox deposit is calculated:

(1) Average Farebox Deposit = Farebox Revenue / Passenger

for BUS: = $99 / 330 riders = $0.30

for RAIL: = $180 / 450 riders = $0.40

This figure is then used to determine total passenger trips:

(2) Total Passenger Trips = Cash & Token Revenue / Average Farebox Deposit

for BUS: = $1,020,000 / $0.30 = 3,400,000 riders

for RAIL: = $4,250,000 / $0.40 = 10,625,000 riders

The usage rate of each system by pass type is:

(3) Usage Rate of System Y_k by Pass Type X_i

$$= \frac{\text{Number of Trips per Month on } Y_k \bullet \text{One-way Fare for } Y_k}{\sum \text{Number of Trips on } Y_k \bullet \text{One-way Fare for } Y_k}$$

for Bus Pass on BUS: = 1

for Rail Pass on RAIL: = 1

for Combo Pass on BUS: $= \frac{30 \bullet \$0.60}{(30 \bullet \$0.60) + (45 \bullet \$0.85)} = \frac{18}{18 + 38.25} = 0.32$

for Combo Pass on RAIL: $= \frac{45 \bullet \$0.85}{(30 \bullet \$0.60) + (45 \bullet \$0.85)} = \frac{38.25}{18 + 38.25} = 0.68$

The pass revenue for each system by pass type is:

(4) Pass Revenue of Pass Type X_i for System Y_k

= Pass Revenue for $X_i \bullet$ Usage Rate of Y_k by X_i

for Bus Pass on BUS: = $400,000 • 1 = $400,000

for Combo Pass on BUS: = $1,380,000 • 0.32 = $441,600

for Rail Pass on RAIL: = $1,620,000 • 1 = $1,620,000

for Combo Pass on RAIL: = $1,380,000 • 0.68 = $938,400

Total pass revenue for each system is:

(5) Total Pass Revenue for System Y_k

$= \sum$ Pass Revenue of Pass Type X_i for Y_k

for BUS: = $400,000 + $441,600 = $841,600

for RAIL: = $1,620,000 + $938,400 = $2,558,400

Total revenue for each system is:

(6) Total Revenue for System Y_k

= Total Pass Revenue for Y_k + Total Cash & Token Revenue

for BUS: = $841,600 + $1,020,000 = $1,861,600
for RAIL: = $2,558,400 + $4,250,000 = $6,808,400

Then the true average fare for the system can be estimated:

(7) True Average Fare for System Y_k

= Total Revenue for Y_k / Total Passenger Trips on Y_k

for BUS = $1,561,600 / 3,400,000 = $0.459
for RAIL = $6,808,400 / 10,625,000 = $0.641

(8) Avg. Pass Ride Value

= (True Avg. Fare - Avg. Farebox Deposit) / Percent of Pass Use

for BUS = ($0.459 - $0.30) / 0.5 = $0.159 / 0.5 = $0.318
for RAIL = ($0.641 - $0.40) / 0.333 = $0.241 / 0.333 = $0.723

"Rapid Transit" or "RT" includes passenger trips starting at both heavy rail (Red, Orange and Blue Lines), and the subway Green Line; "Red, Orange & Blue Lines" or "ROB" accounts for all heavy rail station boardings, excluding transfer stations to the Green Line; and "Subway Green Line" or "Subw. GL" includes trips starting at subway Green Line stations, including transfer stations to heavy rail lines. Rapid transit values, weighted by the number of passenger trips on the heavy rail system and the subway Green Line, are used for calculating "RT weighted 1996" figures, also called "Weighted 96". In future fare-mix studies, this category will replace the "Spring 1996" category for rapid transit, which follows the old unweighted approach.

"Heavy Rail System 1996", or "HR System 96", represents the entire heavy rail system, including those passengers who boarded heavy rail lines (Red, Orange and Blue Lines) at Green Line transfer stations. Similarly, "Light Rail System 1996", or "LR System 96", represents the results for the entire light rail system (surface Green Line and subway Green Line), including the passengers who started their Green Line trip at transfer stations.

The average fare figures for each system are calculated by summing up the average fares of all portions of that system, weighted by the number of passengers using each portion:

Average Farebox Deposit for the Heavy Rail System

= ((Average Farebox Deposit at HR • Passenger Trips starting at HR)
+ (Avg. Farebox Deposit at SwGL • Heavy Rail Trips starting at SwGL))
/ (Passenger Trips starting at RT + Heavy Rail Trips starting at SwGL)

with: HR the Heavy Rail Stations excluding Green Line Transfer Stations
SwGL all Subway Green Line Stations incl. Transfer Stations to HR

Average Farebox Deposit for the Light Rail System

= ((Average Farebox Deposit on SfGL • Passenger Trips on SfGL)
+ (Avg. Farebox Deposit at SwGL • Trips on Green Line starting at SwGL))
/ (Passenger Trips on SfGL + Trips on Green Line starting at SwGL)

with: SfGL the Surface Green Line

In the tables of the next chapter "April 1992" refers to the results of the 1992 *Fare-Mix Study* and "Furth Analysis 1992" to the revised results of the 1992 data generated by Peter G. Furth[23]. "Spring 1996" is the category for the unweighted figures of the data collection effort undertaken in April, May and June 1996. In most cases "Spring 1996" values are comparable to the values of "April 1992", since they were derived by similar methods. For the weekday surface Green Line "Spring 1996" figure, the "Furth Analysis 1992" provides a better basis for comparision. For rapid transit, the "Furth Analysis 1992" results can be best compared to the weighted 1996 figures.

Precision figures are computed only for the overall average fares and shown in parentheses. They are based on the 95% confidence level. For discussion of "Possible Sources of Bias" and "Future Improvements for Sampling and Surveying," refer to Appendix C.

[23]Published in the *MBTA Supplemental Draft Environmental Impact Report on the 1991 Fare Increase.*

5. Sampling Program, Data Collection and Results of Analysis

As previously mentioned, to calculate ridership from revenue information, a reliable estimate of average farebox deposit is required. Estimates of these parameters were obtained by recording the proportion of passengers by fare type and fare revenue for a sample of heavy rail, light rail, and bus riders.

Separate sampling programs were designed for each mode to obtain modal estimates of average farebox deposit, riders by fare category, total ridership, and true average fare. The modal estimates were then combined to obtain system-wide estimates.

Traffic checkers at CTPS and the MBTA performed the actual surveys. CTPS was responsible for providing sample lists, survey forms, instructions, and training, as well as processing and analyzing the data. All forms used in the data collection are shown in Appendix A.

HEAVY RAIL

The heavy rail system consists of the Red, Blue and Orange lines. Heavy rail together with the subway Green Line is called "Rapid Transit" or "RT", and "Red, Orange & Blue lines" or "ROB" refers to heavy rail without subway Green Line stations. The subway Green Line are sampled together with the Red, Orange and Blue lines, since the fare and station entering characteristics of both systems are very similar, however, they are analyzed separately.

Subway passengers enter the system at station entrances through one of three fare collection devices: turnstiles, collector's turnstiles, or gates. Most passengers enter through turnstiles (or "Perry" boxes). Those paying reduced fares enter through the collector's turnstile (which is the one next to the station agent) and deposit their fare in the collector's box (or "S-box").

At the busiest stations, during peak flow periods, passengers can also enter through a manned gate and show passes or deposit cash fares or tokens in the "gateman's" box. For pre-1992 fare-mix studies, the "gateman's" box was open more often, but in 1996 (as in 1992), most were closed to reduce fare evasion.

All turnstiles contain counters that register the number of times the turnstile turns, and thus the number of passengers that pass through. Turnstiles equipped with pass readers also have a second register that records pass use. (For the list of sampled locations and times, see Appendix A.)

Sample Design

Turnstiles and Collector's Turnstiles: There are 60 rapid transit stations. Passengers can enter at more than one entrance at several stations, resulting in a total of 73 collector's booth and turnstile locations. A theoretically sound statistical sample design could not be developed for the rapid transit fare-mix program because data on the data variability by station was not available. Instead, the sample design was driven by the availability of survey personnel, and the need to utilize an appropriate level of resources.

Over 292 person-days (eight hours) would have been required to provide a two-person survey crew for one day (16 hours) at each of the 73 revenue locations. With the six surveyors actually available per day, surveying in this manner would have taken 40 days. If separate weekend fare-mix information at the same precision were also collected, the amount of survey time would have been higher. Since this amount of time was not available, an alternative sample procedure was devised.

Each station was sampled between one and two hours, with twelve different time periods: Early Morning (6:00 to 7:00 AM), AM Peak (7:00 to 8:30 AM), Morning (8:30 to 10:00 AM), Late Morning (10:00 to 11:30 AM), Lunch Time (11:30 AM to 1:00 PM), Afternoon (1:00 to 2:30 PM), School Peak (2:30 to 4:00 PM), PM Peak (4:00 to 6:00), Evening (6:00 to 7:30 PM), Mid-evening (7:30 to 9:00 PM), Late Evening (9:00 to 10:30 PM), and Night (10:30 to 12:00 PM). Stations were selected for each time period randomly. However, downtown and suburban stations, as well as peak and off-peak periods were sampled at a different rate, depending on the ridership volume. The sampling rate for high ridership volume stations was 45%, and for low ridership volume stations 3%.[24] The total sample size was 108, including 85 weekday locations and 33 weekend locations. 26 of the sample locations were at Green Line stations.

Gatebox: Gateman's boxes are only open on special occasions, at limited locations (i.e. State Street during the PM Peak, or Kenmore before and after Red-Sox games). On account of this, no gates were surveyed in 1996.

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[24]That is, each high volume station-period had a 45% chance of being sampled, while the low volume station-periods had a 3% chance of being sampled. Overall, there were 166 high volume station-periods and 710 low volume station periods.

Survey Procedure

Two-person teams were used at each location: one person for surveying the fare-mix through the collector's turnstile, and the other person for surveying the fare-mix through the regular turnstiles. Because of the reliability problems with the turnstile registers, each turnstile was tested prior to each survey shift to determine which turnstile's registers were working and which were not. Turnstiles with non-working registers could not just be ignored, depending on whether the non-working turnstile had a passreader or not, the proportion of pass users through a non-working turnstile would differ from the overall proportion at the survey location. Ignoring the non-working turnstile(s) would skew the total estimate for that location. It was recommended that survey teams arrive at the survey location $^1/_2$ hour before the survey was scheduled to begin in order to have time to perform the test.

Turnstile registers were tested using one of two methods: a *quick* test or an *actual passenger* count test. A turnstile test form, shown in Appendix A, was used to record the results of each test for each turnstile. The form listed the ID numbers for each turnstile in the location to be surveyed. If the ID number is EP-xxx then the turnstile has a pass reader; if the ID is P-xxx it does not. The form has space for testing six turnstiles; locations with more than six turnstiles required the use of two (or more) forms.

To perform a *quick test*, the surveyor used his/her own pass to run the pass through the pass reader (if the turnstile had one) and check the small register near the passreader to see if it was recording properly. Then using tokens, the surveyor checked the larger turnstile register. The surveyor then noted on the form the kind of test performed, and whether the registers were working.

To perform an *actual passenger count test*, the surveyor recorded both the passreader and turnstile register readings in the turnstile and pass boxes on the register reading side of the form. The surveyor also recorded the two beginning manual counter register readings (which, if the counter was zeroed out first, should both have been zero) in the pass and token boxes on the manual count side of the form. The surveyor then counted the number of pass-users and token-users going through the turnstile for a few minutes (but at least 10 passengers). The ending turnstile and counter readings were then recorded. On the register side, the number of token users was derived by subtracting pass-users (if passreader) from the turnstile count. On the count side, total turnstile users was derived by adding pass and token users. Totals were generated by subtracting the beginning counts from the ending counts for each column. The surveyor then noted on the test form the kind of test performed and whether the register(s) worked.

A combination test also could be performed: a surveyor tested the passreader with his/her own pass, and counted total passengers (to test the turnstile

register). If this test was performed, the surveyor checked both boxes—quick and pax[25]—under type of test performed. After the turnstile tests were performed, the surveyors could close turnstiles that had non-functioning registers.

Regular Turnstile Survey: On the turnstile count form, shown in Appendix A, the surveyor noted the kind of survey that was performed for each turnstile: automatic (using the registers) or manual (using the hand counter), or whether the turnstile was closed. The number of turnstiles that could have been manually surveyed at the same time varied with the amount of passenger traffic. It was not possible to manually survey more than one at very busy locations. In the 1996 fare-mix survey, no manual counts were taken; all turnstiles with non-functioning registers were closed.

At the beginning of the survey, the surveyor recorded beginning turnstile and passreader register readings in the turnstile and pass boxes for each "automatic" turnstile. The surveyor recorded the actual survey start time for each turnstile and began the survey. He/she also recorded intermediate turnstile register readings at the end of the first, second, and third half-hours. At the end of the survey, the surveyor recorded the ending register readings and the actual stop time.

Collector's Turnstile Survey: At the beginning of the collector's turnstile survey, eleven types of data were recorded on the Collector's Turnstile form: the beginning farebox readings, the beginning turnstile meter readings, the beginning controller reading, and the seven (one for each fare category) beginning manual counter readings (which should have been zero after resetting the counter bank), and the actual survey start times. The surveyor was supposed to make sure the collector ran down the farebox before recording the register readings. To perform the survey, the surveyor used a manual counter to record each passenger's method of fare payment.

At the end of every half and/or full hour, the surveyor recorded intermediate farebox, turnstile meter, controller, and manual count register readings. At the end of the survey, all ending register readings and the actual time the readings were taken were recorded. The ending readings should all have been taken at the same time.

Survey Coding , Processing and Sample Results

The completed forms were checked for accuracy and completeness by CTPS, and, where possible, corrections were made. The data on the forms were then

[25] "Pax" is an abbreviation for passenger.

keyed into two different data files, one each for turnstiles and collector's boxes. The records are documented in Appendix B.

Turnstiles: The survey in spring 1996 resulted in 70 acceptable weekday records and 31 acceptable weekend records. 22 of the total 101 records are from subway Green Line stations. Only two methods of fare payment—tokens (adult cash) or adult passes—can be used at turnstiles. Sample estimates of fare category proportions for passengers that entered through turnstiles were generated by summing passengers across station records, and dividing by the total number of passengers. These sample estimates are shown in Table 5-1. Compared to 1992, pass use decreased in 1996 during the week and increased during the weekend. During the week more passengers use a pass on the Red, Orange and Blue lines than on the subway Green Line, whereas during the weekend the opposite is true.

Table 5-1
Rapid Transit, Subway Green Line and Heavy Rail
Turnstile Fare Category Proportions in Percentages

		Adult Cash	Adult Pass
Weekday:	**RT April 1992**	**54.5**	**45.5**
	RT Spring 1996	**56.5**	**43.5**
	RT weighted 1996	**56.4**	**43.6**
	Red, Orange & Blue Lines	52.7	47.3
	Subway Green Line	67.4	32.6
	Heavy Rail System 1996	**53.7**	**46.3**
Weekend:	**RT April 1992**	**63.8**	**36.2**
	RT Spring 1996	**59.3**	**40.7**
	RT weighted 1996	**59.6**	**40.4**
	Red, Orange & Blue Lines	60.2	39.8
	Subway Green Line	57.6	42.4
	Heavy Rail System 1996	**60.0**	**40.0**

Table 5-2 shows the calculated average farebox deposits for the turnstile sample. From 1992 to 1996, the average farebox deposit increased weekdays and decreased weekends. The weekday average farebox deposit on the Red, Orange and Blue lines is lower than that on the subway Green Line, but on the weekend the opposite is true. However, Quincy Center, Quincy Adams and Braintree were not surveyed on weekends, which makes the average farebox deposit figures for the Red Line slightly lower than they are in reality.

Table 5-2
Rapid Transit, Subway Green Line and Heavy Rail
Turnstile Average Farebox Deposit in Dollars

		Avg. Farebox Deposit
Weekday:	**RT April 1992**	**0.490**
	RT Spring 1996	**0.512**
	RT weighted 1996	**0.511**
	Red, Orange & Blue Lines	0.490
	Subway Green Line	0.573
	Heavy Rail System 1996	**0.496**
Weekend:	**RT April 1992**	**0.575**
	RT Spring 1996	**0.504**
	RT weighted 1996	**0.506**
	Red, Orange & Blue Lines	0.512
	Subway Green Line	0.490
	Heavy Rail System 1996	**0.510**

Collector's Turnstiles: Collector's turnstile surveys were performed at the same times and locations as the regular turnstile surveys. Only non-adult cash or non-adult pass rapid transit passengers are supposed to pay their fare at collector's turnstiles. However, adult fare passengers sometimes also use the collector's turnstiles. Therefore, collector's turnstile passengers are categorized into seven groups based on the methods of fare payment: Adult cash fare ($0.85 or $1.70), adult monthly pass, reduced fare for senior citizens and persons with disabilities ($0.20), children fare (50% of adult fare: $0.40 to $0.85), student pass (free during school periods until 6:00 PM), authorized free (MBTA employees, as well as passengers with free transfers from certain bus routes, and on Sundays a free second passenger on a monthly pass), and unauthorized free (fare evaders).

Farebox register readings were used to record the *actual* farebox revenue for passengers passing through collector's turnstiles. These farebox readings may differ from the actual revenue because of malfunction of the registers, the operator not running down the farebox prior to recording the readings, or inaccurate recording of the register readings.

To provide a check for reasonableness of the farebox revenue for each location, the collector's turnstile record spreadsheet generated an independent

estimate of the minimum farebox revenue that should have been deposited at the location based on surveyed fare category proportions. This estimate was used to approximate collector's turnstile farebox revenue for locations where the farebox register data were suspect.

Table 5-3 shows collector's turnstile sample estimates of fare category proportions. In 1996, fewer passengers who are not supposed to enter at the collector's turnstile (such as adult cash payers and pass holders), actually did use the collector's turnstile. Because there were fewer adult cash riders and pass users at the collector's turnstile, the percentages of senior citizens and disabled people, as well as those of children and students were higher. Two

Table 5-3
Rapid Transit, Subway Green Line and Heavy Rail
Collector's Turnstile Fare Category Proportions in Percentages

		Adult Cash	Adult Pass	Sen. Cit. & Disabled	Child Half	Stud. Pass	Free
Weekday:	**RT April 1992**	**9.4**	**31.0**	**29.7**	**5.4**	**15.7**	**8.8**
	RT Spring 1996	**8.6**	**18.0**	**33.5**	**11.5**	**19.0**	**9.5**
	Weighted 96	**7.4**	**18.2**	**34.3**	**12.0**	**17.4**	**10.8**
	ROB	9.8	17.8	32.6	11.1	20.6	8.2
	Subw. GL	0.3	19.4	39.4	14.6	7.7	18.6
	HR System 96	**9.1**	**17.9**	**33.1**	**11.3**	**19.7**	**8.8**
Weekend:	**RT April 1992**	**10.7**	**28.6**	**30.7**	**10.9**	**0.8**	**18.3**
	RT Spring 1996	**7.7**	**24.8**	**37.0**	**15.2**	**0.3**	**15.0**
	Weighted 96	**7.7**	**24.5**	**36.4**	**15.4**	**0.3**	**15.7**
	ROB	7.8	26.5	40.7	14.1	0.3	10.5
	Subw. GL	7.3	18.7	23.4	19.1	0.4	31.1
	HR System 96	**7.8**	**26.0**	**39.6**	**14.5**	**0.3**	**11.9**

results are suspicious, and may be due to data collection or sampling errors. First, on weekdays only 0.3% of the passengers passing the collectors turnstile at subway Green Line stations pay cash, which is very low compared to stations on the Red, Orange and Blue lines, where 9.8% of the passengers pay cash. And secondly, on weekends 31.1% of the subway Green Line boardings through the collector's turnstile were in the category free, a figure about three times higher than at stations on the Red, Orange and Blue lines.

Average farebox deposit for the collector's turnstile sample is shown in Table 5-4. The average farebox deposit was stable for weekends, but increased for weekdays, since the rate of adult pass holders fell more than the rate of passengers paying cash.

Table 5-4
Sample Subway Green Line/Rapid Transit Collector's Turnstile
Average Farebox Deposit in Dollars

		Avg. Farebox Deposit
Weekday:	**RT April 1992**	**0.162**
	RT Spring 1996	**0.191**
	RT weighted 1996	**0.182**
	Red, Orange & Blue Lines	0.200
	Subway Green Line	0.129
	Heavy Rail System 1996	**0.195**
Weekend:	**RT April 1992**	**0.186**
	RT Spring 1996	**0.186**
	RT weighted 1996	**0.185**
	Red, Orange & Blue Lines	0.190
	Subway Green Line	0.169
	Heavy Rail System 1996	**0.186**

Fare Category Proportions and Average Fares

Separate estimates of entries into the rapid transit system through the turnstiles and collector's turnstile were calculated based upon the amount of revenue collected at each. Total ridership was then determined by combining the turnstile and collector's turnstile data. Only stations with both turnstile records were used for the 1996 calculation, which was not the case in the 1989 and *1992 Fare-Mix Studies*, when the number of records from collector's turnstiles was greater than the number of regular turnstiles. As a result, the collector's turnstile had a higher weight in 1989 and 1992, leading to overstating all fare categories but adult cash and pass, especially senior citizen and disabled people. As a result the average farebox deposit was too low, which caused the number of passenger boardings to be overestimated.[26]

[26]According to the *1992 Fare-Mix Study* about 18.5% of all passengers entered the station through the collector's turnstile, whereas in 1996 only 10.2% did so, the latter number being

Table 5-5 shows the fare category by week, the weekdays and the weekend. Between 1992 and 1996 the percent of passengers paying cash increased on weekdays and decreased on weekends. The trend for passengers who hold a pass was the opposite. For the whole week, there were more cash payers and slightly fewer pass users. On weekdays and during the whole week, the subway Green Line had more cash payers and less pass users compared to the Red, Orange and Blue lines. The drop in the percentage of senior citizens and disabled persons between 1992 and 1996 can be explained by analysis error of the 1992 Fare-Mix Study mentioned above. Even though a sampling and/or data collection error is also possible in the 1996 estimation, the result of 3.5% of all riders being in this category, as opposed to 6.1% in 1992, is more consistent with the surface Green Line values (1992: 3.6%, and 1996: 4.0%).

Table 5-5
Rapid Transit, Subway Green Line and Heavy Rail
Fare Category Proportions in Percentages

		Adult Cash	Adult Pass	Sen. Cit. & Disabled	Child Half	Stud. Pass	Free
Week:	**RT April 1992**	**46.2**	**41.6**	**6.1**	**1.3**	**2.7**	**2.1**
	RT Spring 1996	**52.0**	**40.7**	**3.5**	**1.3**	**1.6**	**1.1**
	Weighted 96	**51.9**	**40.7**	**3.5**	**1.3**	**1.6**	**1.1**
	ROB	48.5	43.2	4.0	1.4	2.0	1.0
	Subw. GL	62.1	33.5	2.0	0.9	0.3	1.3
	HR System 96	**49.4**	**42.5**	**3.9**	**1.3**	**1.9**	**1.0**
Weekday:	**RT April 1992**	**45.0**	**42.4**	**6.3**	**1.1**	**3.3**	**1.8**
	RT Spring 1996	**51.9**	**41.0**	**3.2**	**1.1**	**1.8**	**0.9**
	Weighted 96	**52.0**	**41.0**	**3.2**	**1.1**	**1.8**	**0.9**
	ROB	48.0	44.0	3.6	1.2	2.3	0.9
	Subw. GL	64.1	32.0	2.0	0.7	0.4	0.9
	HR System 96	**49.1**	**43.2**	**3.5**	**1.2**	**2.2**	**0.9**
Weekend:	**RT April 1992**	**54.0**	**34.8**	**5.7**	**2.0**	**0.1**	**3.4**
	RT Spring 1996	**52.2**	**38.5**	**5.1**	**2.1**	**0.0**	**2.1**
	Weighted 96	**52.1**	**38.3**	**5.5**	**2.1**	**0.0**	**2.0**
	ROB	51.8	37.6	6.6	2.3	0.1	1.7
	Subw. GL	53.1	40.3	2.1	1.7	0.0	2.8
	HR System 96	**51.9**	**37.8**	**6.3**	**2.2**	**0.1**	**1.8**

more realistic. This implies that all 1992 rapid transit fare categories but adult cash and pass are nearly two times too high.

The overall results for the average farebox deposit and the true average fare are shown in Table 5-6. Between 1992 and 1996 the average weekday farebox deposit seems to increase, but whether this is true remains unclear, because of the likelihood that the 1992 figure was too low. The farebox deposit is higher for the subway Green Line than for the Red, Orange and Blue lines because more people on the Green Line pay cash. On the weekend the farebox-deposit decreased, which might be partially due to the lack of surveyed stations in rapid transit Zone 2 and 3 (Quincy Center, Quincy Adams and Braintree). There is also virtually no difference between the subway Green Line and the Red, Orange and Blue lines on weekends. The true average fare for the heavy rail system, which includes cash fares as well as pass revenue, is $0.815.

Table 5-6
Rapid Transit, Subway Green Line and Heavy Rail
Average Fares in Dollars

		Avg. Farebox Deposit		True Avg. Fare	Avg. Pass Ride Value
Week:	**RT April 1992**	**0.432**			
	RT Furth Analysis 1992	**0.444**	**(12.8%)**		
	RT Spring 1996	**0.478**	**(10.9%)**		
	RT weighted 1996	**0.477**	**(10.6%)**		
	Red, Orange & Blue Lines	0.458	(13.8%)		
	Subway Green Line	0.533	(15.0%)		
	Heavy Rail System 1996	**0.463**	**(12.4%)**	**0.815**	0.828
Weekday:	**RT April 1992**	0.421			
	RT Furth Analysis 1992	0.437	**(14.6%)**		
	RT Spring 1996	**0.481**	**(12.5%)**		
	RT weighted 1996	**0.481**	**(11.9%)**		
	Red, Orange & Blue Lines	0.458	(15.9%)		
	Subway Green Line	0.551	(17.1%)		
	Heavy Rail System 1996	**0.464**	**(14.1%)**		
Weekend:	**RT April 1992**	**0.503**			
	RT Furth Analysis 1992	**0.508**	**(18.8%)**		
	RT Spring 1996	**0.460**	**(12.0%)**		
	RT weighted 1996	**0.460**	**(12.0%)**		
	Red, Orange & Blue Lines	0.460	(12.3%)		
	Subway Green Line	0.461	(31.0%)		
	Heavy Rail System 1996	**0.460**	**(11.0%)**		

(Note: Numbers in parentheses are the precision figures at the 95% confidence level.)

The average pass ride value of $0.828 implies that the number of trips taken by pass users is not very much above the break-even point, causing it to be only 9.8% lower than an estimated average adult cash fare on heavy rail of approximately $0.92.[27] Surveys of pass usage usually indicate that pass users ride the system significantly more frequently than the break-even level. The discrepancy between these two findings is explained by the different approaches to the average pass ride value figure. In this fare-mix survey, the value was derived by dividing total pass revenue attributable to one mode (say, heavy rail) by the apparent number of trips for which the pass was used. All type of passes are included in the calculation, even higher cost passes (combo, combo plus and commuter rail passes). In contrast, pass survey figures are derived by dividing the reported number of monthly trips for each pass type by the price of each of the pass types. Thus, while the average pass ride value for a subway pass may be $0.46 (according to a 1994 survey), the average pass ride value for all types of passes would be closer to the $0.828 found in this study. Also, it is likely that the respondents in passenger surveys are those riders who use the system most often, and they may even overstate their usage. To the extent that this is the case, the average pass ride value derived from passenger surveys would be too low.

LIGHT RAIL

This fare-mix report is the first one that analyzes the surface Green Line together with the subway portion of the Green Line. However, in order to be able to compare the data with earlier fare-mix reports the results for the surface and subway portions of the Green Line are also presented separately.

For data collection purposes the surface Green Line is sampled differently from the subway portion. The overall average farebox deposit is calculated by weighting the averages from the surface Green Line and the Green Line portion of the subway.

The light rail system consists of four Green Line branches (B, C, D, and E), as well as the Mattapan High Speed Line, which was not surveyed because virtually no fares are collected. The sections of the B, C, and D Line west of Kenmore and the E Line west of Copley and north of North Station are considered surface Green Line. The turnstiles at Lechmere are used only during the morning peak period. At other times, fares at Lechmere are collected on board.

Green Line riders are classified as either "Subway Green Line" or "Surface Green Line" passengers depending on where they enter the MBTA system.

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[27]This figure and the average pass ride value both include trips taken from Zone 2 and 3 stations.

Persons boarding the Green Line on the surface are considered surface Green Line passengers irrespective of where they are traveling to. Conversely, outbound riders boarding the Green Line in the subway portion are considered subway Green Line passengers. (As a result of these definitions, there are more inbound than outbound riders on the surface Green Line.)

Sample Design

An adaptation of the Section 15 revenue-based sampling procedure (normally used for buses) was applied to the surface Green Line fare-mix survey with the following differences:

- Surface Green Line fares are collected only in the inbound direction; no fare is charged on the surface in the outbound direction. In the inbound direction, surveyors conducted a survey in a manner similar to that conducted for buses: farebox register readings were recorded at the beginning and the end of the trip, and boarders were classified according to their fare payment method. In the outbound direction, register readings were not recorded (since no fares are collected), and all boarders were classified in the authorized free fare category.

- The sample was stratified by line and the following time periods: Weekday early, AM, Base, School, PM, and Evening, as well as Weekends. This procedure follows the "Technical Memorandum" for statistical analysis of MBTA ridership data from Peter G. Furth[28]. The exact methodology is described in a memorandum to the MBTA (July 1997).

Survey Team Shift Schedules

A random sample of surface Green Line trips needed to be surveyed. Since Green Line trips operate both in the subway and on the surface and because only surface data were needed in this sample, it would have been inefficient to provide a randomly selected list of trips to be surveyed (such as is done for the bus system fare-mix survey sample). Instead, CTPS used a procedure that resulted in a random sample of surface trips without the pre-selection of trips, as described below.

In essence, the procedure required that outbound trips begin at Copley Station and that survey teams board the first outbound train, regardless of the line. The teams were instructed to perform an outbound survey for the surface portion of that trip, and, after disembarking at the end of the trip, perform a

[28]See *MBTA Supplemental Draft Environmental Impact Report on the 1991 Fare Increase*, January 1993.

fare-mix survey on the surface portion of the next inbound trip on that line back to Copley. At Copley, they were then to take the next train outbound and continue surveying in that fashion until the end of their shift. Sampling was also scheduled so that an equal number of inbound and outbound trips were sampled. This procedure would in theory provide an unbiased distribution of trips by line.

An adequate distribution of trips by time of day was also required. An examination of the Green Line schedule showed that the scheduled number of trips per hour between 6:00 AM and 7:00 PM was about twice as great than at other times of the day. Because the number of trips sampled per hour using CTPS' suggested method did not vary according to trip frequency, it was expected that the number of trips per hour surveyed by each team would not vary by time of day. Therefore, to ensure that a representative sample of trips is surveyed, CTPS suggested that checker coverage be twice as dense during the 6:00 AM to 7:00 PM time period than during other times. To accomplish this, twice as many survey teams *per hour or shift* would be scheduled during the 6:00 AM to 7:00 PM time period than during other times.[29] The same approach was used on weekends, however, fewer trips were surveyed.

Survey Procedure

Survey instructions, which included sample survey forms, were forwarded to MBTA supervisors. The survey forms are shown in Appendix A. Eight-barrel hand-held counters were also distributed.

Survey teams were comprised of two crew members: one observer, and one recorder. With the exception of trips starting at Lechmere, most survey shifts started at Copley Station, where the survey team was supposed to board the first outbound train, regardless of line, and performed an *outbound* survey.

In the outbound direction, the survey team counted and recorded the number of passengers on-board immediately after the car left the last underground station. For E line trips, the beginning onboard passenger count was recorded right after Symphony and before the first surface stop. For B, C, and D line trains, the beginning onboard passenger count had to be recorded right after the Kenmore stop, and before the first surface stop.[30] Because no fares are collected in the outbound direction, no farebox data was recorded. After the train reached the surface, passengers boarding on the surface portion of the trip were counted and recorded. It was suggested that one person be in

[29]This approach is not necessary in the future, since the stratification takes care of the above described problem.

[30]During periods when there where no token collectors at Prudential and Symphony, these two stations were treated as surface stops.

position at the front half of the car to count (using a hand-held counter) passengers boarding through the front and middle door, and the second person be in position to count passengers boarding through the rear door. At the end of the trip, the number of surface boarders counted by each surveyor was indicated in the authorized free category on the survey form: e.g. 19 (front) + 11 (rear) = 30 boarders. At the end of the outbound trip, survey teams took the first inbound trip on that line.

For an inbound trip, the survey team first recorded the trip identification and farebox information before the start of the trip, making sure that the operator ran down the farebox before recording the farebox register information and before any passengers boarded. Then, for the surface portion of the inbound trip, the method of fare payment for each boarder was recorded. One person kept an eye on boarders and the farebox, and called out the type of fare paid for each boarder; the second person recorded the information on the survey form. The survey team tried to position themselves so that they had an unobstructed view of boarding passengers. Immediately after the last surface stop, the team recorded the number of passengers on the vehicle and the ending farebox data (after the farebox had been run down). This information had to be recorded before the first underground stop. Surveying continued in this cyclical manner until the end of the survey shift. At the end of the shift survey teams went back to the station were they started.

Several other procedures were followed:

- Surveyors used a new blank form for each one-way trip, and recorded the appropriate trip identification information on each form: team members, day, date, car house, vehicle number, first, second, or third car, route number, direction, scheduled start time (if known), and actual survey start time. Different survey information was recorded for inbound and outbound surveys.

- On inbound trips, if it was determined before the trip started that the farebox register was not working properly, the survey team took the next inbound trip instead. If it was obvious that the farebox was not registering only after the trip started, the surveyors got off, went back to the end of the line, and took the next inbound train.

- At Copley, if two or more teams were waiting to board outbound trains at the same time, the teams boarded trains on a first-in/first-out basis.

- For two-car trains, teams alternated surveying the first or second car for inbound and outbound trips separately. For example, if the first car of a two-car train was surveyed on an outbound trip, the second car was surveyed the next time the team surveyed an outbound two-car train. Teams also alternated on inbound two-car train trips. Surveying one-car

trains in between two-car trips did not count as surveying the first car of a train for these purposes.

- Survey teams did not board outbound trains that were designated to terminate at Kenmore. If surveyor team unknowingly boarded a train that short-turned at Kenmore, they got off, and took the next outbound train.

- Surveyors on inbound Riverside trips put a large vertical slash in each fare category box after passing the Chestnut Hill station and before arriving at Reservoir, so that a distinction could be made between passengers who boarded before Reservoir, and were supposed to pay $2.00, and those who boarded between Reservoir and Fenway Park, and were supposed to pay $1.00.

Fare Categories

For outbound trips all surface Green Line passengers are categorized as authorized free. For inbound trips there are seven methods of fare payment: adult cash fare ($0.85 on all lines except the D Line, $2.00 between Riverside and Chestnut Hill, and $1.00 from Reservoir to Fenway), adult monthly pass (bus, subway, combo or higher), reduced fare for senior citizens and persons with disabilities ($0.20), children fare (50% of adult fare: $0.40 to $1.00), student pass (free during school days until 6:00 PM), ten-ride tickets (between Riverside and Chestnut Hill) and Newton local coupon, authorized free (MBTA employees, or free guest on Sundays), as well as unauthorized free (fare evaders).

It was often difficult for the surveyor to accurately determine the fare category for boarding passengers for the following reasons: passengers don't always show the proper ID when depositing reduced fares; determining the fare category by observing the amount of change deposited is difficult; the farebox was not always run down between passengers; and it was sometimes difficult for the surveyor to get situated in a good location when he or she boarded the vehicle.

Survey Coding and Processing

The survey forms were checked for accuracy and completeness by CTPS, and, if possible, corrections were made. The data on the forms were then keyed into a trip record data file. Separate trip record files were generated for each surface Green Line routes. The records are shown in Appendix B.

Estimation of Fare Evasion Rate

In earlier fare-mix studies, farebox register readings were used to estimate the farebox deposit. Normally the fare evasion rate would be calculated by taking the difference of the estimated minimum farebox deposit (the number of passengers in each fare category multiplied by each category's fare level) and the actual farebox reading divided by the estimated farebox deposit. However, with the electronic fareboxes the basic farebox reading includes cash only, meaning that the "fare evasion" rate is about as high as the rate of token use on the surface Green Line, approximately 30%. With the lack of an exact number of token deposits by trip, it was impossible to calculate an exact fare evasion rate. Because the actual annual token deposits matched well to the estimated token deposit derived from the survey results and farebox readings, it was assumed that there were virtually no fare evaders on the surface Green Line. Thus the minimum farebox deposit figures were used for computing the average fares. It is recommended for future fare-mix studies to count token users in a separate category from passengers paying cash.

Table 5-7 summarizes the sample estimates of average fares for all routes of the surface Green Line. From 1992 to 1996, the average farebox deposit decreased weekends for all Green Line branches, and increased weekdays, except for the D Line. The D Line has the highest average farebox deposit, since it serves more than one fare zone. The B Line has the lowest average farebox deposit, closely followed by the C Line. The B Line has also the lowest ratio of round-trip to inbound average farebox deposit, which means it has the most outbound surface stop boardings; the E Line has the highest ratio and thus the smallest number of outbound surface stop boardings.

Fare Category Proportions and Average Fares

In order to come up with an overall average fare for all routes of the surface Green Line as well as for the light rail system, the total farebox revenue and number of passengers for the surface and subway portions of the Green Line were combined in a weighted average (see Appendix B). The figures for the light rail system exclude the Mattapan High Speed Line, which was not surveyed in the Spring 1996 data collection effort due to the fact that virtually no fares are collected on board.

Table 5-8 shows the weighted average sample estimates of fare category proportions for the total surface Green Line and the light rail system. In general, the proportion of each fare category was very stable between 1992 and 1996. Only the number of cash payers decreased on the weekend while free trips increased. In 1996, the number of free boardings on the weekend is much higher than at weekdays, which is consistent with the subway Green Line result (see Table 5-3). Pass use is more common on weekdays than on

weekends. When surface Green Line is compared to the light rail system, the percentage for all fare categories except adult cash and free rides are similar. However, as expected, the light rail system has more cash payers and exactly as many fewer passengers who travel for free.

Table 5-7
Surface Green Line Average Fares in Dollars

		Avg. Farebox Deposit (Inbound)		Avg. Farebox Deposit (Round-Trip)	
B Line:	**Weekday**				
	April 1992	0.374		0.218	
	Spring 1996	0.368	(6.7%)	0.226	(18.1%)
	Weekend				
	April 1992	0.424		0.281	
	Spring 1996	0.441	(8.9%)	0.264	(8.7%)
	Week 1996	**0.378**	**(5.6%)**	**0.235**	**(7.9%)**
C Line:	**Weekday**				
	April 1992	0.344		0.243	
	Spring 1996	0.328	(6.4%)	0.249	(10.6%)
	Weekend				
	April 1992	0.397		0.287	(7.1%)
	Spring 1996	0.390	(6.7%)	0.263	
	Week 1996	**0.341**	**(5.4%)**	**0.252**	**(8.9%)**
D Line:	**Weekday**				
	April 1992	0.652		0.482	
	Spring 1996	0.634	(7.5%)	0.440	(10.3%)
	Weekend				
	April 1992	0.871		0.681	
	Spring 1996	0.888	(7.2%)	0.655	(13.5%)
	Week 1996	**0.686**	**(6.1%)**	**0.482**	**(8.5%)**
E Line:	**Weekday**				
	April 1992	0.357		0.292	
	Spring 1996	0.385	(4.7%)	0.335	(5.4%)
	Weekend				
	April 1992	0.479		0.421	
	Spring 1996	0.450	(6.8%)	0.392	(8.3%)
	Week 1996	**0.400**	**(4.0%)**	**0.348**	**(4.6%)**

(Note: Numbers in parentheses are the precision figures at the 95% confidence level.)

The results for the average farebox deposit, the true average fare and the average pass ride value are shown in Table 5-9. The weekly and weekday average farebox deposit increased slightly between 1992 and 1996. The average fare is higher on the weekend than on weekdays. The average farebox deposit is also higher for the light rail system than for the surface Green Line, since the whole system has a lower percentage of free trips. The true average fare accounting for both cash and pass revenue is $0.602.

Table 5-8
Surface Green Line and Light Rail Round-Trip
Fare Category Proportions in Percentages

		Adult Cash	Adult Pass	Sen. Cit. & Disabled	Child Half	Stud. Pass	Free	Other
Week:	Surface GL							
	April 1992	31.2	33.0	3.6	0.7	0.6	30.8	—
	Spring 1996	30.3	32.6	4.0	1.0	1.2	30.8	0.2
	LR System 96	44.0	33.0	3.1	1.0	0.8	18.1	0.1
Weekday:	Surface GL							
	April 1992	29.5	31.9	4.0	0.7	0.7	33.1	—
	Spring 1996	29.9	34.0	4.2	1.1	1.4	29.3	0.2
	LR System 96	44.6	33.1	3.2	0.9	1.0	17.1	0.1
Weekend:	Surface GL							
	April 1992	38.1	27.4	4.6	1.0	0.0	28.9	—
	Spring 1996	32.5	25.8	3.1	0.5	0.1	37.8	0.2
	LR System 96	41.4	32.0	2.7	1.0	0.1	22.7	0.1

According to the average pass ride value of $0.691, pass users receive a larger discount on the Green Line than on heavy rail. This is due to the fact that:

- Green Line pass users take more trips per week than heavy rail pass users (15.2 vs. 13).[31]
- the Green Line has fewer combo or combo plus pass riders than heavy rail.
- lower priced local bus passes account for 2.4% of all passes used on the Green Line.

[31]Derived from the results of the *MBTA Systemwide Passenger Survey* (1994).

Table 5-9
Surface Green Line and Light Rail Round-Trip Average Fares in Dollars

		Avg. Farebox Deposit		True Avg. Fare	Avg. Pass Ride Value
Week:	**Surface Green Line**				
	Inbound only				
	Spring 1996	0.454	(3.6%)		
	Round-Trip				
	April 1992	**0.312**			
	Spring 1996	**0.322**	**(4.5%)**		
	Light Rail System 1996	**0.413**	**(7.0%)**	**0.602**	**0.691**[32]
Weekday:	**Surface Green Line**				
	Inbound only				
	Spring 1996	0.433	(4.3%)		
	Round-Trip				
	April 1992	**0.298**			
	Furth Analysis 1992	**0.289**	**(7.3%)**		
	Spring 1996	**0.307**	**(5.2%)**		
	Light Rail System 1996	**0.412**	**(7.9%)**		
Weekend:	**Surface Green Line**				
	Inbound only				
	Spring 1996	0.531	(5.9%)		
	Round-Trip				
	April 1992	**0.384**			
	Spring 1996	**0.380**	**(8.8%)**		
	Light Rail System 1996	**0.415**	**(14.3%)**		

(Note: Numbers in parentheses are the precision figures at the 95% confidence level.

BUS AND TRACKLESS TROLLEY

Bus and trackless trolley fare proportion and average fare estimates were obtained by recording the type of fare paid for passengers boarding a sample of local, zoned, and express bus and trackless trolley trips. This section describes the sample design, the survey procedure, and survey data processing and analysis. A comparison between the current bus fare-mix survey procedures and the procedures used for previous fare-mix surveys is also presented.

[32]This figure excludes free outbound surface trips.

Sample Design

In 1985, the MBTA began an ongoing bus and trackless trolley data collection program to satisfy annual FTA (then UMTA) Section 15 reporting requirements. This revenue-based sampling program is designed to generate estimates of annual bus and trackless trolley passengers and passenger-miles. The revenue based sampling procedure consists of counting boarding and alighting passengers, and farebox data, on 208 randomly selected one-way bus trips throughout the year, and developing estimates of farebox revenue per passenger and passenger-mile. Annual revenue estimates are then divided by the sample average revenue per passenger and revenue per passenger-mile estimates to obtain estimates of total annual bus and trackless trolley passengers and passenger-miles. The sample size of 208 bus trips is based on typical transit system variances for variables of interest and provides statistically significant values at the 95 percent confidence level with ±10 percent precision.

Revenue-based procedures were used because they are efficient and statistically valid. Revenue-based procedures require the random selection of bus trips, as opposed to the random selection of bus passengers. Random selection of bus trips is easily to accomplish: bus trips are designated and can be selected easily from the population of all bus trips. Random selection of bus passengers is problematical: bus passengers are not labeled and there is no available list of them. Therefore it is difficult to select passengers in a manner that does not introduce bias. Revenue-based procedures rely on the theory that the data across the sample selected from the population is normally distributed with the sample mean approaching the population mean.

An adaptation of the Section 15 revenue-based sampling procedure was used in the fare-mix surveys to estimate the bus and trackless trolley average fare, riders by fare category, and total ridership. There were some differences between Section 15 and fare-mix procedures:

- Section 15 surveys are designed so that estimates of total passengers and passenger-miles are generated for each sample bus trip. In order to develop estimates of these variables, the surveyors count the number of boarding and alighting passengers at each stop. Different information was needed for the fare-mix surveys, specifically the number of riders by fare category. Therefore, the procedure was adjusted so that the surveyor counted only boardings for each trip, and denoted each passenger's method of fare payment. Alighting was not counted.

- Typically, Section 15 surveying is spread throughout the year; trips are sampled at the rate of four per week, resulting in the required annual total of 208 bus trips. In the case of the 1996 fare-mix study, average fares and

fare category proportions were derived from the survey performed in spring 1996, rather than spread over an entire year.

Prior to the survey period, a list of randomly selected bus and trackless trolley trips was generated. CTPS checkers performed the surveys on the buses. All together 210 bus trips were surveyed, 172 on weekdays and 38 on weekends. It should be noted that the sample trips were selected from a population of all bus and trackless trolley trips, including zoned and express buses (refer to Appendix A).

Survey Procedure

The bus trip sample list was divided into pieces of work lasting between one and four hours. To perform the bus trip surveys, checkers were instructed to board the bus at the beginning of the designated bus trip; get situated in a spot where the type of fare paid could be seen; record the beginning farebox register readings and trip start time; record the type of fare paid by all boarding passengers; and record farebox register readings and the time at the end of the trip.

Survey Coding and Processing

After completion of the surveys, the completed forms were checked against the sample list. The forms were then checked for accuracy and completeness, and, where possible, corrections were made. The data on the forms were then keyed into a data file.

In the resultant data file, each bus trip is represented by one bus trip data record, and each record comprises 24 data fields, representing the 24 items on the survey form. After data entry was completed, the data file was imported into a spreadsheet program. The spreadsheet was designed to calculate sample estimates of fare category proportions and average revenue per passenger. The records are documented in Appendix B.

Fare Category Proportions

Bus passengers were categorized by one of seven methods of fare payment: adult cash fare (base fare: $0.60, zoned buses: $1.00 to $1.50, and express buses: $1.50 to 2.25), adult monthly pass, reduced fare for senior citizens and persons with disabilities ($0.15), children fare (50% of adult fare: $0.30 to $1.10), student pass (free during school days until 6:00 PM), authorized free (MBTA employees, as well as passengers with free transfers on certain bus routes or free guests on Sundays), and unauthorized free (fare evaders).

It was often difficult for the surveyor to accurately determine the fare category for boarding passengers. Passengers don't always show the proper ID when depositing reduced fares, and determining the fare category by observing the amount of change deposited was also difficult, especially when passengers were boarding rapidly. Crowded buses also presented problems because it was sometimes difficult for the surveyor to get situated in a good location. This was especially true if the checker boarded a bus trip that was on the second leg of an interlined trip, or if there were passengers remaining on board from the previous trip.

Sample estimates of fare category proportions were generated by summing passengers across bus trip records, and dividing by the total number of passengers. The resulting fare category proportions are shown in Table 5-10. The percent of both adult cash and adult pass increased from 1992 to 1996, while reduced fare categories decreased. This is most likely a result of a sampling error and/or a failure of the data collectors to recognize how many riders were paying discounted fares. The fact that more people use passes than pay cash did not change over the last four years.

Table 5-10
Bus and Trackless Trolley Fare Category Proportions in Percentages

	Week		Weekday		Weekend	
	1992	1996	1992	1996	1992	1996
Adult Cash	35.8	38.8	35.8	38.8	38.4	38.9
Adult Pass	35.9	40.1	35.9	39.2	39.4	44.3
Senior Citizens & Disabled	11.4	6.9	11.4	6.7	13.7	7.7
Child Half	8.7	4.1	8.7	3.9	4.4	5.0
Student Pass	5.2	5.8	5.2	6.9	0.1	1.0
Free	3.2	4.3	3.1	4.6	4.0	3.2

Farebox Revenue on Sampled Trips

Farebox register readings were used to estimate the average farebox deposit, which was determined by dividing the amount of revenue collected on sampled trips by the number of passengers on sampled trips. The revenue is automatically registered by the farebox, with the exception of tokens, which were not recorded. This is not a real problem, since according to MBTA revenue audits, only 0.6% of bus riders use tokens. The average farebox deposit was then used in conjunction with total farebox revenue, again

excluding token revenue, to determine total ridership. (Token revenues were used, however, for the estimation of the true average fare.)

To provide a check for reasonableness of the farebox revenue for each trip, the spreadsheet was designed to generate an independent estimate of the minimum farebox revenue that should have been deposited for each bus trip record. An *estimated minimum farebox revenue,* figure was generated by multiplying the number of passengers in each fare category by the each category's fare level. The estimated minimum fare revenue was then compared to the farebox readings. There were often differences between these figures, which were attributable to the following factors:

- The farebox misclassified some of the deposited coins.
- The operator forgot to run down the farebox prior to recording the readings.
- The surveyor did not accurately read the farebox.
- The surveyor was not able to accurately determine the fare category for boarding passengers, resulting in an inaccurate recording.
- Fare evasion occurs, since some passengers do not deposit the appropriate fare amount.
- For zoned routes, it is likely that the estimated minimum farebox revenue would be less than the estimated farebox revenue. Checkers cannot keep track of where passengers board and alight, and consequently the fare that should have been deposited. For lack of specific information related to average fares on zoned routes, the base fare for each fare category was used in the trip record spreadsheet to generate the estimated minimum farebox revenue for each bus trip record. It should be noted that there is more incentive for fare evasion on zoned routes—operators do not know where passengers will alight and therefore what the appropriate fare is at the time the fare is paid. Also, the higher fares make it easier to "shortchange" the farebox.

The bus trip record spreadsheet was designed to flag bus trips for which the farebox revenue differed from the estimated minimum farebox revenue by a significant amount. Given the likely source of the differences between the farebox revenue and the estimated minimum farebox revenue, it seemed more reasonable to expect the farebox revenue (as an approximation of the actual farebox revenue) to be lower than the estimated minimum rather than higher: passengers are more likely to evade the fare rather than to pay more than they should. Therefore, it was decided that the farebox revenue was unreasonable if it did not meet the following criteria:

- It was less than 80% or greater than 110% of the estimated minimum farebox revenue.

Throwing out all the unreasonable records would decrease the sample size and worsen the precision. Therefore it was decided to use the estimated minimum farebox revenue—reduced by an appropriate factor to account for fare evasion—as an approximation of the actual farebox revenue. The fare evasion rate was very low, approximately 3.7%. (It should be noted that the presence of checkers on the bus sample trips may have deterred some fare evasion. This may have resulted in a biased estimate of fare evasion rates.)

Average Fares

Table 5-11 summarizes the average farebox deposit, comparing it to the 1992 values, and the true average fare.

Table 5-11
Bus and Trackless Trolley Average Fares in Dollars

		Avg. Farebox Deposit	True Avg. Fare	Avg. Pass Ride Value
Week:	**April 1992**	**0.263**		
	Spring 1996	**0.249** (10.4%)	**0.445**	**0.489**
Weekday:	**April 1992**	**0.261**		
	Spring 1996	**0.249** (12.1%)		
Weekend:	**April 1992**	**0.277**		
	Spring 1996	**0.253** (19.1%)		

(Note: Numbers in parentheses are the precision figures at the 95% confidence level.)

The average farebox deposit decreased from 1992 to 1996 as a result of increased pass use. Even though more zoned and express buses with higher fares are in service on weekdays and, compared to the weekend, about the same percentage of passengers pay cash, the average fare is on weekends higher than on weekdays. For the total week, the true average fare, which includes both cash fare and pass revenue, is $0.445, and the average pass ride value is $0.489, showing that pass users are enjoying a significant discount, because of their frequent riding of MBTA buses.

COMMUTER RAIL

Methods of Fare Payment

Unlike other MBTA service modes, the commuter rail system uses neither fareboxes nor turnstiles for fare collection. Consequently, there are no farebox deposits *per se*. Commuter rail passengers pay their fares using passes and a variety of ticket forms. In past fare-mix studies, for comparability with other modes, farebox deposit for commuter rail has been defined as revenue derived from rides made using tickets. This revenue has been calculated by multiplying the number of rides made on a representative day with each ticket form by the price per ride with such a ticket, and summing the results for all ticket forms.

Tickets can be purchased at the downtown Boston commuter rail stations or at independent ticket agencies at scattered locations throughout the commuter rail service area. Single-ride, round-trip, and family-fare tickets can also be purchased on board trains. Twelve-ride tickets, priced the same as 10 full fares from the same zone, and 10-ride tickets, priced the same as 10 half fares, are sold only at off-train locations. Tickets for inter-zone trips (trips not to or through a station in Zone 1A or 1B or one of the downtown Boston stations) can only be purchased on board.

Tickets purchased on board are valid only on the date of sale, and are the only tickets for which revenue is accounted for by individual days. For ticket sales at stations and agencies only monthly totals are recorded. It is therefore necessary to use information from a combination of several sources to calculate the fare-mix for commuter rail.

Information Sources for Fare Revenue

Information on commuter rail cash and pass sales and revenue is contained in the monthly revenue ridership report prepared for the MBTA by Amtrak. This report accounts for most passes and tickets sold in a given month, but does not show the days on they were actually used. It is also incomplete in three areas: Zone 1A through 2 pass sales, on-board ticket sales, and off-train Family and Group Fare sales.

Train audit reports, usually prepared two to four times a year, show the number of passengers, by fare payment method, using each inbound train on a sample weekday, Saturday, and Sunday. These are supposed to be for representative days, but when expanded by the number of weekdays and weekend days in the same month as the audit, and doubled to account for outbound ridership, they invariably predict far more riders in each ticket category than the number of fares sold. Therefore, although they are of some

use in estimating weekend and weekday ridership splits, audit numbers cannot be used directly.

The methods used by CTPS to calculate ridership from the information in the revenue ridership reports are described below.

Method of Ridership and Fare-Mix Calculation

Adjustments of Pass Sales Data: All commuter rail passes for Zone 1 or higher are also valid for up to maximum fares on all MBTA rapid transit, light rail, bus, and trackless trolley routes, except that a few express bus routes require cash in addition to a Zone 1 pass. On some express bus routes, the minimum pass option available for payment of full fare is the Zone 1 or Zone 2 pass, but commuter rail is the only mode on which a Zone 3 or higher pass is ever required. The Revenue Ridership reports include sales of all Zones 3 through 9 or Inter-zone passes, regardless of sales location. Zone 1 and 2 passes are included if they are sold at commuter rail stations or suburban ticket agencies, but not if sold through the employer pass program or at MBTA pass sales offices. Some Zone 1 and 2 passes purchased at railroad stations or agencies are used exclusively on express buses, but survey and available count results indicate that the number of these is much smaller than the number of Zone 1 and 2 passes purchased for commuter rail use through the employer pass program or through MBTA sales offices. Therefore, the revenue ridership report significantly understates Zone 1 and 2 pass ridership.

In ridership calculations for fare-mix studies, it is necessary to estimate the number of Zone 1 and 2 passes purchased for commuter rail use through the employer pass program or through MBTA sales offices. In this fare-mix study, these sales have been estimated by applying factors to Zone 1 and 2 pass sales at railroad stations and ticket agencies. The factors were based partly on the proportions of pass sales by location in zones for which the revenue ridership report totals are complete, and partly on the sales locations reported by pass users in the 1993 commuter rail passenger survey.

No passes are issued specifically for commuter rail Zone 1A or 1B, but all passes other than the local bus pass are valid at stations in these zones. The least costly pass option for a Zone 1A or 1B rider is the Subway pass. The number of Subway, Combo, and Combo Plus passes sold at railroad stations and ticket agencies alone greatly exceeds total ridership at all Zone 1A and 1B commuter rail stations. Revenue ridership reports do not allocate any of these pass sales to the commuter rail system, but survey results show that the vast majority of Zone 1A and 1B passengers are pass users. Therefore, ticket sales reports alone significantly understate Zone 1A and 1B ridership.

For purposes of fare-mix ridership calculations starting with 1993, sales of passes for Zone 1A and 1B commuter rail use have been estimated on the basis of special passenger counts made at all Zone 1A and 1B stations by CTPS in the fall of 1994. Average daily Zone 1A and 1B ridership using tickets was calculated from sales figures in revenue ridership reports and subtracted from the passenger count totals to find pass totals. (Subsequent counts at selected stations show little change in Zone 1A and 1B ridership since 1994.)

Adjustments of On-Board Ticket Sales Data: In the revenue ridership reports, each on-board ticket sale is reported as one passenger trip sale. This substantially understates ridership from on-board sales, as an on-board ticket may be issued for a round trip, or for several passengers making one-way or round trips. The maximum number of passenger trips that can be sold on one ticket is ten (a round-trip ticket for five passengers).

To determine more accurate factors for rides sold using on-board tickets, CTPS obtained the actual conductors' ticket receipts for on-board sales for one weekday, one Saturday, and one Sunday in October 1994. Tallies were then made of the trips for which these tickets were punched, separated by endpoints, fare category, and number of riders. It was found that the average on-board ticket accounted for 1.35 passenger trips on the weekday, 1.71 on the Saturday, and 1.65 on the Sunday, excluding tickets for special trains to Foxboro Stadium.

Using the tallies of ride sales by category and the fares applicable to each ride, average revenue per ticket was calculated separately for the weekday, Saturday, and Sunday samples. Because of a higher incidence of passengers traveling together on one ticket on weekends, average revenue for on-board tickets was significantly higher on weekends ($4.56 Saturday, $4.45 Sunday) than on weekdays ($3.39). The weekday figure includes surcharges for on-board purchases, when collected; surcharges are not applicable on weekends. Overall on-board ticket sales produced average revenue of $3.67 per ticket in September 1993, $3.65 in April 1994, and $3.77 in March 1996. The revenue averages for the October 1994 sample days were assumed to be representative of weekdays, Saturdays, and Sundays for 1993, 1994, and 1996 in general. Simple algebraic formulas were then used to estimate the relative numbers of weekday and weekend sales needed to yield the overall reported averages for months used in the fare-mix studies.

Adjustment of Family and Group-Fare Sales Data: A family-fare ticket allows two adults to make a round trip with up to three children for the price of two adult round trips, or for the price of one adult round trip if a pass is presented. About 80% of family fares are sold on board trains and are included in overall on-board ticket sales. In the revenue ridership reports, off-train sales of family fares are reported separately for each railroad station and ticket agency. Those sold at South Station or Back Bay show the number of passengers for

which they are issued, by zone. These numbers must be doubled to find total ride sales. Reports from suburban ticket agencies show total family fare sales but not the number of passengers per ticket. For purposes of fare-mix ridership calculations, it is assumed that the average number of riders per family-fare ticket for agency sales in each zone is the same as that for on-board sales from the same zone. (The latter figure is based on the 1994 on-board ticket sales sample.)

Family-fare ticket sales for North Station in the revenue ridership reports are combined with group fare sales, such as for school field trips in the breakdowns of sales by zone, and in the overall summary. Breakdowns of ticket sales by seller show total sales of group tickets, total group ticket passengers and total revenue from these sales. They do not show the number of zones traveled or the mix of full and half-fare passengers in groups. Large month-to-month variations in group ticket sales indicate that they are for non-repetitive trips, but they account for at most 0.25% of total monthly ridership. For these reasons, group ticket sales (as well as sales of tickets for special trains to Foxboro Stadium) were excluded from the ridership analysis.

Revenue Allocation Between Weekdays and Weekends: As noted above, the Revenue Ridership Reports show ticket and pass sales and revenue by month, but do not show when these tickets and passes were used. The tallies of on-board ticket sales made by CTPS for October 1994 sample days provided factors for separating on-board sales totals into weekday and weekend ridership by fare category. Off-train sales were separated as described below.

Tickets/Cash Fares: In the revenue ridership reports, off-train ticket sales are broken down into five categories: One-way (full fares), half fare, 10-ride, 12-ride, and family fares. Round-trip tickets are issued only for the special trains to Foxboro Stadium. Otherwise, passengers requesting round-trip tickets are sold two one-way tickets. Half-fare and 10-ride tickets are sold to four categories of riders: senior citizens, disabled, children under 12, and students (high school or younger). The fare-mix study calls for separation of reduced fares into senior/disabled and child/student, but the revenue ridership reports do not show reduced fare sales by sub-category.

Ticket audit reports were done for September 1993, and March 1996, but the report nearest to April 1994 was for May 1994. To estimate the splits of weekend and weekday off-train ticket sales, the audit day figures for each year were first summarized on a zone-by-zone basis for each fare category. Since the audit figures included inbound trains only, they were doubled to approximate two-way ridership. The results were multiplied by the number of weekdays, Saturdays, and Sundays in each month. In the 1993 figures, Labor Day was assumed to have characteristics closest to those of a Sunday. Projections for April 1994 were made using the May audit figures, with adjustments for Easter and Patriot's Day. In the 1996 figures, Evacuation Day,

a holiday for some public employees, was assumed to have characteristics closest to those of a normal weekday.

The expanded audit figures for each fare category were next compared with the ticket sales totals shown in the corresponding revenue ridership reports. Audit report figures do not distinguish between on-board and off-train ticket sales. One-way full and half fares, and family fares can be purchased either on or off trains, but 10-ride and 12-ride tickets are only sold off-train. To compare one-way, half-fare and family fare sales with audit projections, off-train sales figures for each zone were taken directly from the revenue ridership reports. These were added to on-board sales by zone, calculated by applying factors derived from the October 1994 on-board ticket sample to the total reported on-board sales.

Audit reports are supposed to show results for typical days. When projected to full months, however they show far more riders in most ticket categories than can be accounted for by ticket sales. This indicates either that ridership is unusually high on the audit days, that it is grossly over-reported, or that a large proportion of ticket sales are unaccounted for. Of these, the third possibility is the least likely.

For full fare one-way trips, ticket sales accounted for only 65% of projected audit totals for September 1993, 64% for April 1994, and 54% for March 1996. The discrepancy for half-fares was even greater, at 46%, 47%, and 47%. Family fares had an 81% ratio for 1993, but only 54% for 1994 and only 16% for 1996. (Half fare and family fare ridership is largely non-repetitive, so results from a single day can vary substantially from the monthly averages.)

Comparisons of sales and audit projections for 10-ride and 12-ride tickets were based entirely on off-train sales figures. Ticket sales for each form were multiplied by the number of rides for which the ticket was valid. Sales for 10-ride tickets accounted for only 33% of the number of rides on such tickets projected from Audit figures for 1993, 31% for 1994, and 38% for 1996. (Again, this may reflect the non-repetitive nature of many reduced-fare trips.) For 12-ride tickets, the ratio was 63% in 1993 and 1994 but only 57% in 1996.

In fare-mix analyses for years prior to 1993 it was assumed that although overall audit figures were too high, the proportions of weekday and weekend ridership were probably reasonable. When uniform adjustment factors were applied to the 1993 and later audit projections, it was found that in most zones, adjusted weekend ridership on one-way full fare tickets was less than the estimate of on-board ride sales alone from revenue data. Therefore, it was decided to apply most of the adjustment to weekday ridership and use weekend full fares as projected from the audits. This resulted in average reductions of 50% in the 1993 weekday figures, 53% in the 1994 figures, and 62% in the 1996 figures compared with audit projections.

Similarly, most of the reductions in the audit projections of rides on half-fare and multiple-ride tickets were applied to weekday ridership. Sub-splits of half fare ridership into senior citizens and persons with disabilities and children/students were based on the splits in the audit reports, as these were reasonably consistent with the splits found in the on-board ticket samples.

About 80% of all family-fare tickets are sold on board trains. In the 1993 results, the audit projections for Weekday and Sunday family fare rides were close to the estimated totals for on-board sales alone. This implied that most Family fares sold off-train were used on Saturdays. For the fare-mix analyses for all three years, weekday and Sunday family fare totals were taken directly from the on-board estimates. Saturday figures were calculated by adding Saturday on-board sales estimates to total monthly off-train family fare sales. Family fares account for under 0.2% of weekday ridership, so assumptions about allocation of off-train Family fare sales have an insignificant impact on average fare estimates.

Because of changes in the calculation methods, weekend ridership shown in fare-mix calculations for 1993 and later years appears to have increased dramatically compared with earlier reports. In reality, this is mostly the result of corrections for allocation formulas that formerly credited too little ridership to weekends.

Passes: The 1993 commuter rail survey included a question on the number of days per week that passengers usually use commuter rail. The responses to this question from pass holders provided a means of estimating the percentage of issued passes that are used on an average weekday. The frequency of use question did not ask which days of the week passengers used the service. Estimates of the weekday pass use are maximized by assuming that riders traveling five days a week or less make all their trips on weekdays. In that case, the number of passes used on a given weekday is obtained by weighting five-day users by 1.0, four-day users by 0.8, etc.

Passengers using passes five days a week or less could actually use them for a combination of weekdays and weekend days (such as four weekdays and one Saturday,) but such patterns are probably uncommon. Audit figures, which are more likely to overstate than understate ridership, indicate that under 12% of outstanding commuter rail passes are used on Saturdays, and under 6% on Sundays.

The survey did not ask how many trips per day passengers made on commuter rail. Passengers using commuter rail for travel in only one direction each day would be unlikely to purchase passes, as they would not be cost-effective. Because of the relatively long trip distances served by commuter rail, very few passengers would have time or reason to make more than one round trip per day on any one line. The 1993 survey results showed

that only about 0.5% of all commuter rail riders made trips involving two commuter rail lines. For these reasons, it was assumed that average weekday pass ridership was equal to twice the number of issued passes that were used on a typical weekday.

The survey results indicated that only 3.3% of pass holders usually used commuter rail six days per week, and that only 0.6% usually used it seven days per week. These figures probably understate the percentages of issued passes used on weekends. First, as noted above, use on five days per week or less could include one or two weekend days. Second, the question did not ask pass holders how often they rode on weekends, but how many days per week they usually used commuter rail. A passenger using commuter rail on less than half of all weekends would be likely to consider that this was not "usually." Most months have eight or nine weekend days. If the average pass holder used commuter rail on only one weekend day per month, then an average of 11 to 12 percent of all issued passes would be used on an average weekend day. This is closer to the audit figures than to the survey figures. Lacking better information, the audit figures for Saturday and Sunday pass use, doubled for two-way travel, were used in the fare-mix analysis.

Fare Category Proportions and Average Fares

Tables 5-12 and 5-13 summarize the results of the fare-mix analyses for September 1993 and March 1996.[33] The results for the two years shown differ only slightly. Pass use among commuter rail riders is much higher

Table 5-12
Commuter Rail Fare Category Proportions in Percentages

	Week		Weekday		Weekend	
	1993	1996	1993	1996	1993	1996
Adult Cash	35.5	34.8	32.4	31.4	66.5	66.6
Adult Pass	59.2	60.2	63.0	64.0	20.4	24.5
Senior Citizens & Disabled	3.2	3.0	2.8	2.9	7.2	4.2
Child/Student Half	1.3	1.2	0.9	0.9	5.3	4.1
Free	0.9	0.8	0.9	0.8	0.7	0.6

[33]Results of a 1992 commuter rail fare-mix analysis are not directly comparable with these, because of changes in the calculation methods.

than that on any of the other MBTA modes, at around 60%. This is probably the result of many different factors, including higher proportions of commuter rail riders making daily trips and lower proportions of commuter rail riders eligible for half fares. The 1993 survey results show that about 40% of commuter rail pass riders transfer to or from another MBTA service, further increasing the savings from pass use.

Table 5-13
Commuter Rail Average Fare in Dollars

		Avg. Farebox Deposit	True Avg. Fare	Avg. Pass Ride Value
Week:	September 1993	1.081	2.161	1.825
	March 1996	1.062	2.386	2.196
Weekday:	September 1993	0.948		
	March 1996	0.921		
Weekend:	September 1993	2.429		
	March 1996	2.398		

The largest differences between the 1993 and 1996 results were in weekend pass use, which increased from 20.4% to 24.5% and in weekend ridership among senior citizens and persons with disabilities, which decreased from 7.2% to 4.2%. These differences may have resulted more from random variation in ridership between the audit days used in the weekend calculations than from overall trends.

Table 5-13 indicates that the weekly farebox deposit decreased from $1.081 to $1.062 between 1993 and 1996. In the same interval, the true average fare increased from $2.161 to $2.386 and the average pass value increased from $1.825 to $2.196. The underlying data show more rapid growth in ridership among pass users (9%) than among ticket users (4%). This resulted in greater growth in total ridership than in ticket revenue, and the consequent decrease in average farebox deposit. The increases in true average fare and in average pass value were results of greater growth rates in ridership in the higher fare zones. Overall weekly ridership increased by 7% from 1993 to 1996. Gains in Zones 4 through 8 ranged from 7% to 22%, but changes in Zones 1A through 3 ranged from a loss of 3% to a gain of 6%. Zone 9 showed a 53% ridership

gain, mostly as the result of implementation of Worcester service in September 1994.

REVENUE FIGURES AND ESTIMATION OF RIDERSHIP

Revenue figures are necessary in order to estimate passenger boardings. The following monthly revenue data are available from the MBTA Revenue Department: rapid transit stations token sales are reported, which neither means that these tokens are used in the same month nor for the rapid transit; cash fares and tokens redeemed are collected separately for the surface Green Line and bus; monthly pass revenue is available by pass type. The MBTA Daily Revenue Summaries, used in the *1992 Fare-Mix Study*, are not produced anymore, thus it is not possible to estimate ridership figures for weekdays and the weekend separately.

Passenger boardings for each system were estimated by dividing total system farebox revenue by the average system farebox deposit. In order to come up with passenger boardings by week, needed to compare the results with the April 1992 figures, the annual ridership is first calculated and then divided by 52[34]. This approach is described in Chapter 4, Formula 2, and an example is shown in Box 4-1. It is important to mention that the boardings shown in Table 5-14 are linked trips, attributed to the system where the trip begins. That is, 100,000 light rail trip boardings could include, say 20,000 transfers to heavy rail, which are not accounted for in the heavy rail figure. Thus, the 100,000 light rail trip boardings represent 120,000 unlinked trips (100,000 light rail and 20,000 heavy rail trips).

Table 5-14 exhibits passenger boardings and revenue from the farebox and pass sales. Altogether, in 1996 the MBTA had over 4.9 million weekly boardings. Even though for the core system (the whole system, except commuter rail) total boardings decreased by more then 90,000 boardings per week (2%), farebox revenue increased by 3.2%. Commuter rail boardings increased between 1993 and 1996 by 6.6%. Rapid transit boardings were essentially unchanged,[35] while the surface Green Line showed a slight increase. The bus system exhibited a significant drop (5%), continuing a long standing trend of declining ridership. In 1996, the bus system moved the most passengers (1.85 million per week), followed by heavy rail (1.66 million per week), light rail (0.98 million per week) and commuter rail (0.43 million per week).

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[34]The division of the annual data by 52 is reasonable, because the number of passenger boardings in spring is about the same as the average for the entire year; somewhat higher than the summer, but lower than the fall.

[35]The lack of an increase in rapid transit boardings and revenue is likely due to the 1992 figures being too high (see pp. 33-34).

Table 5-14
Weekly Passenger Boardings and Revenue by Mode

	Passenger Boardings	Total Revenue	Farebox Revenue	Pass Sales Revenue
Rapid Transit				
April 1992	2,069,764	—	$894,409	—
Furth Analysis 1992	2,014,435	—	—	—
Spring 1996	—	—	$986,595	—
Unweighted	2,064,196	—	—	—
Weighted	2,067,637	—	—	—
Heavy Rail System 1996	1,659,533	$1,352,114	$769,100	$583,014
Surface Green Line				
April 1992	531,473	—	$166,018	—
Spring 1996	539,995	—	$174,079	—
Mattapan HSL	30,500[36]	—	—	—
Light Rail System 1996	978,599	$570,921	$391,574	$179,347
Bus System				
April 1992	1,950,806	—	$512,160	—
Spring 1996	1,853,128	$825,167	$461,682	$363,485
Core System				
April 1992[37]	4,496,714[38]	$2,476,187	$1,572,587	$903,600
Spring 1996[37]	4,460,760	$2,748,202	$1,622,356	$1,125,846
Incl. Mattapan HSL	4,491,260			
Commuter Rail				
September 1993[39]	400,760	$865,983	$433,264	$432,719
March 1996	427,133	$1,018,994	$453,506	$565,488
Total System				
Spring 1996	4,918,393	$3,767,196	2,075,862	1,691,334
Excl. Mattapan HSL	4,887,893	—	—	—

[36]The Mattapan High Speed Rail figure is based on a 1995 passenger count.

[37]Passenger boardings do not include passenger boardings on the Mattapan High Speed Trolley.

[38]Uses the ridership value derived from P. Furth's 1992 average farebox figure, which is corrected for the error causing rapid transit ridership in the *1992 Fare-Mix Study* to be too high (see pp. 33-34).

[39]This figure is for 1993, since the equivalent commuter rail data are not available for 1992.

Appendix A:
Survey Forms and Sample Lists/Schedules

This appendix contains:

1. The survey forms used in the 1996 fare-mix survey, presented in the following order:

   - Heavy Rail and subway Green Line
   - Surface Green Line
   - Bus and trackless trolley

2. The sample lists and schedules for rapid transit, presented in the following order:

   - Heavy Rail and subway Green Line
   - Surface Green Line
   - Bus and trackless trolley

   Not all scheduled trips were surveyed or used for the analysis. The ones which were used are shown as records in Appendix B.

1996 Fare-Mix Study
Rapid Transit Turnstile Test Form

Shift Identification Information

Station ______________________ Location ______________________

Surveyor(s) ______________________ Day ______________________

______________________ Date ______________________

Scheduled Start Time ______________________ Scheduled End Time ______________________

***Instructions:** Test each turnstile separately. Note the type of test performed: actual passenger (pax) or quick test. For actual pax count test:*

1. *Record beginning time, turnstile, and pass register reading (if turnstile has a passreader).*
2. *Using manual denominater, record pass and token users through turnstile (for either 5 minutes or ten passengers).*
3. *Record ending time, turnstile and pass register reading.*
4. *For both register and manual readings, subtract end figures from begin figures and enter in spaces for totals.*
5. *Compare register and manual totals. If they match the registers are OK. If they don't match, they are not functioning properly.*

Turnstile Tests

Turnstile ID Number	Type of Test		Time	Register Reading Turnstile	Register Reading Pass	Register Reading Token	Manual Count Turnstile	Manual Count Pass	Manual Count Token	Reg-isters OK?
	☐ Pax	Begin	AM PM							☐ Yes
		End	AM PM							
	☐ Quick	Total								☐ No
	☐ Pax	Begin	AM PM							☐ Yes
		End	AM PM							
	☐ Quick	Total								☐ No
	☐ Pax	Begin	AM PM							☐ Yes
		End	AM PM							
	☐ Quick	Total								☐ No
	☐ Pax	Begin	AM PM							☐ Yes
		End	AM PM							
	☐ Quick	Total								☐ No
	☐ Pax	Begin	AM PM							☐ Yes
		End	AM PM							
	☐ Quick	Total								☐ No
	☐ Pax	Begin	AM PM							☐ Yes
		End	AM PM							
	☐ Quick	Total								☐ No

1996 Fare-Mix Study
Rapid Transit Turnstile Survey Form 1

Shift Identification Information

Station _____ 2 Location _____ 3

Day _____ 5

Surveyor _____ 4 Date _____ 6

Scheduled Start Time _____ 7 Scheduled End Time _____ 8

Actual Start Time _____ 9 Actual End Time _____ 10

1. *From turnstile register test form, enter whether the count is automatic or manual for each turnstile.*
2. *For automatic survey: record beginning, intermediate and ending times, turnstile, and pass readings (if turnstile has pass reader) for each turnsile in the "Turnstile" and "Pass" rows.*
3. *For manual survey: record beginning, intermediate and ending times. Then, using denominator, record the number of pass and token riders passing through the turnstile. Record the beginning, intermediate and ending figures in the "Pass" and "Token" rows. (It may not be possible to keep track of all non-working turnstiles at the same time. Do as many as you can.)*

Turnstile Readings/Counts

		Begin	Intermed	Intermed	Intermed	End	Comments	
Turnstile ID Num: 11	*Time:*	AM PM	AM PM	AM PM	AM PM	AM PM		
	Turnstile Readings:							12
Test: ☐ Auto ☐ Manual ☐ Closed	*Pass Readings:*							13
	Token Readings:							14
Turnstile ID Num: 15	*Time:*	AM PM	AM PM	AM PM	AM PM	AM PM		
	Turnstile Readings:							16
Test: ☐ Auto ☐ Manual ☐ Closed	*Pass Readings:*							17
	Token Readings:							18
Turnstile ID Num: 19	*Time:*	AM PM	AM PM	AM PM	AM PM	AM PM		
	Turnstile Readings:							20
Test: ☐ Auto ☐ Manual ☐ Closed	*Pass Readings:*							21
	Token Readings:							22

23 24 25

1996 Fare-Mix Study
Rapid Transit Collector's Turnstile Survey Form 1

Shift Identification Information

Station 2 Location 3

Day 5

Surveyor 4 Date 6

Scheduled Start Time 7 Scheduled End Time 8

Actual Start Time 9 Actual End Time 10

Collector's Farebox Readings

Note: Run down farebox at beginning and end of each trip before recording gatebox readings.

Collector's Box #: 11

Time:	Begin AM PM	Intermediate AM PM	Intermediate AM PM	Intermediate AM PM	End AM PM	Comments
Cash:	12				13	
Tokens:	14				15	
Pennies	16				17	
Controller					18	

Passengers Passing through Collector's Turnstile

	Time:	Begin AM PM	Intermed AM PM	Intermed AM PM	Intermed AM PM	End AM PM	Comments	
Adult	Cash							18
	Pass							19
E & H	Reduced							20
Children & Student	1/2 Fare							21
	Pass							22
Free	Authorized							23
	Non-Authorized							24

1996 Fare-Mix Study
Surface Green Line Survey Form 1

Trip Identification Information

Route # _____ 2 | Direction: ☐ In ☐ Out 3

Observer _____ 4 | Day: _____ 6

Recorder _____ 5 | Date: _____ 7

Survey Start Time _____ 8

Vehicle # _____ 9

Car: ☐ 1st ☐ 2nd ☐ 3rd 10

Farebox Readings (Inbound trips only)

Note: Run down farebox at beginning and end of each trip before recording farebox readings.

	Beginning Reading	Ending Reading
Cash:	11	12
Dollar bills received during trip:		13

Passenger Counts

Adult	Cash	14
	Pass	15
E & H	Reduced	16
Children & Student	1/2 Fare	17
	Pass	18
Free	Non-Authorized	19
	Authorized	20

Portal Load Count

Inbound: Pax on-board after last surface stop: 21	**Outbound:** Pax on-board after last subway stop: 22

1996 Fare-Mix Study
Surface Green Line Survey Form - D LINE INBOUND ONLY 1

Trip Identification Information

Route # _____ 2 Direction: ☐ In ☐ Out 3

Observer _____ 4 Day: _____ 6

Recorder _____ 5 Date: _____ 7

Survey Start Time _____ 8

Vehicle # _____ 9

Car: ☐ 1st ☐ 2nd ☐ 3rd 10

Farebox Readings (Inbound trips only)

Note: Run down farebox at beginning and end of each trip before recording farebox readings.

	Beginning Reading	Ending Reading
Cash:	11	12
Dollar bills received during trip:		13

Passenger Counts

Note: For inbound Riverside trips, put vertical line in all fare categories after passing Chestnut Hill

Adult	Cash	14
	Pass	15
	10-Ride Ticket (D Line)	16
	Cash + Newton Local Coupon	17
E & H	Reduced	18
Children & Student	1/2 Fare	19
	Pass	20
Free	Non-Authorized	21

Portal Load Count

Inbound: Pax on-board after last surface stop: 22	**Outbound:** Pax on-board after last subway stop: 23

1996 Fare-Mix Study
Bus/Trackless Trolley Survey Form 1

Trip Identification Information

Route # _____ 2 Direction: ☐ In ☐ Out 3

Garage _____ 4

Bus # _____ 5 Day: _____ 6

Surveyor: _____ 8 Date: _____ 7

Ride from: _____ To: _____

Scheduled Departure Time _____ 9 Actual Departure Time _____ 10

Passengers Remaining On-Board from Previous Trip: 11

Farebox Readings

Note: Run down farebox at beginning and end of each trip before recording farebox readings.

	Beginning Reading	Ending Reading
Cash:	11	12
Dollar bills received during trip:		13

Passenger Counts

Adult	Cash	20
	Pass	21
E & H	Reduced	22
Children & Student	1/2 Fare	23
	Pass	24
Transfers		25
Short fare	Cash	26
Free	Authorized	27
	Non-Authorized	28

Table A-1
Sample List and Schedule for
Heavy Rail and Subway Green Line

Early Morning	AM Peak	Morning	Late Morning	Lunchtime	Afternoon	School	PM Peak	Evening	Mid -Evening	Late Evening	Night	Saturday	Sunday
6:00 AM –7:00 AM	7:00 AM –8:30 AM	8:30 AM –10:00 AM	10:00 AM –11:30 AM	11:30 AM –1:00 PM	1:00 PM –2:30 PM	2:30 PM –4:00 PM	4:00 PM –6:00 PM	6:00 PM –7:30 PM	7:30 PM –9:00 PM	9:00 PM –10:30 PM	10:30 PM –12:30 AM		
Kendall (Inbound)	Community College	Downtown Crossing (Summer Street)	Stony Brook	Downtown Crossing (Winter Street)	Beachmont	State (Old State House)	Park Street (Westbound)	North Quincy (North)	Chinatown (Outbound)	Andrew	Harvard (Church Street)	*6:00 AM–7:00 AM*	*8:00 AM–7:00 AM*
Quincy Adams	Alewife (Main)	North Quincy (Busway)	Orient Heights	Ashmont	Boylston (Inbound)	Government Center	State (Old State House)	Park Street (Winter/Tremont Street)	Airport	South Station	North Station	Maverick	NONE
Maverick	Jackson Square	Porter	Government Center	Harvard (Main)	Braintree	Copley (Outbound)	Hynes Convention Center	Downtown Crossing (Summer Street)	Haymarket (Busway)	Quincy Adams	Park Street (Northbound)	*7:00 AM–8:30 AM*	*7:00 AM–8:30 AM*
	Harvard (Main)	Harvard (Main)	Quincy Center	Downtown Crossing (Summer Street)		JFK/UMass	Downtown Crossing (Chauncy Street)	State (Water Street)	Boylston (Outbound)	Malden Center		Mass Ave.	NONE
	Andrew	Central (Central)	Braintree	Braintree		Quincy Center	Downtown Crossing (Winter Street)	Park Street (Westbound)	Government Center			*8:30 AM–10:00 AM*	*8:30 AM–10.00 AM*
	Fields Corner	Quincy Center				Porter	State (Water Street)					Central (Inbound)	Porter
	Ashmont	Sullivan				Back Bay	JFK/UMass					Sullivan	
	Davis	Malden Center				Fields Corner	Revere Beach					*10:00 AM–11:30 AM*	*10:00 AM–11:30 AM*
	Quincy Adams	Back Bay				Arlington	Harvard (Main)					Government Center	Orient Heights
	Wellington	Forest Hills				Kenmore	Ruggles					*11:30 AM–1:00 PM*	*11:30 AM–1:00 PM*
	North Station	Maverick				Copley (Inbound)	NEMC (Washington Street)					Downtown Crossing (Summer Street)	Downtown Crossing (Winter Street)
	Mass Ave						Aquarium					Ashmont	
	Wollaston						South Station					*1:00 PM–2:30 PM*	*1:00 PM–2:30 PM*
	Forest Hills						Central (Inbound)					Boylston (Inbound)	Malden Center
	Wonderland											Charles	Kenmore
	Beachmont											*2:30 PM–4:00 PM*	*2:30 PM–4:00 PM*
												State (Old State House)	Copley (Outbound)
												Arlington	Government Center
												Back Bay	Davis
												4:00 PM–6:00 PM	*4:00 PM–6:00 PM*
												Hynes Convention Center	Central (Inbound)
												Downtown Crossing (Winter Street)	State (Milk Street)
												Aquarium	Ruggles
												6:00 PM–7:30 PM	*6:00 PM–7:30 PM*
												Park Street (Westbound)	Park Street (Westbound)
												7:30 PM–9:00 PM	*7:30 PM–9:00 PM*
												Haymarket (Busway)	Airport
												9:00 PM–10.30 PM	*9:00 PM–10:30 PM*
												Malden Center	South Station
												10:30 PM–12:00 AM	*10:30 PM–12:00 AM*
												Harvard (Main)	NONE

Table A-2
Sample List and Schedule for Surface Green Line

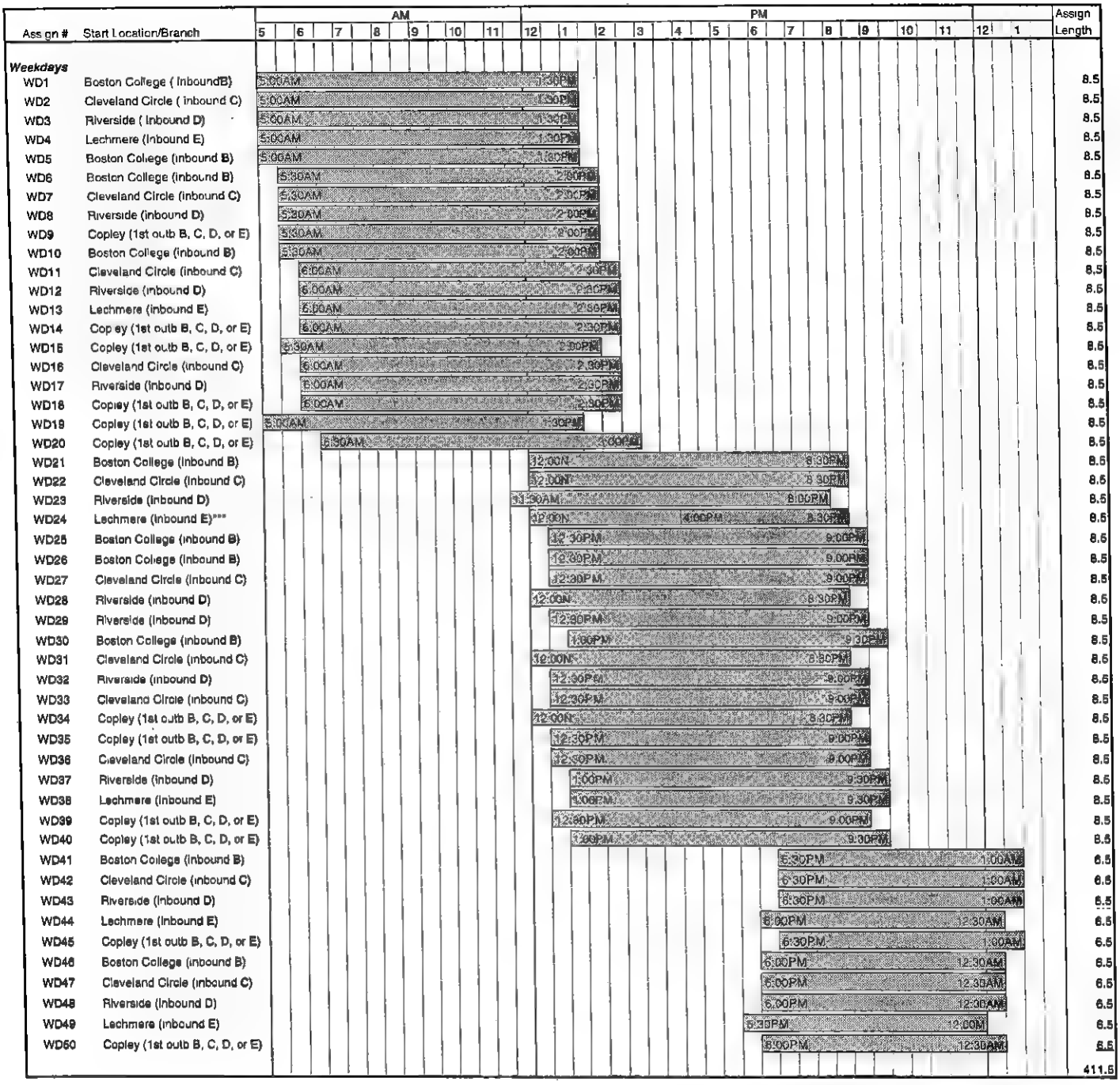
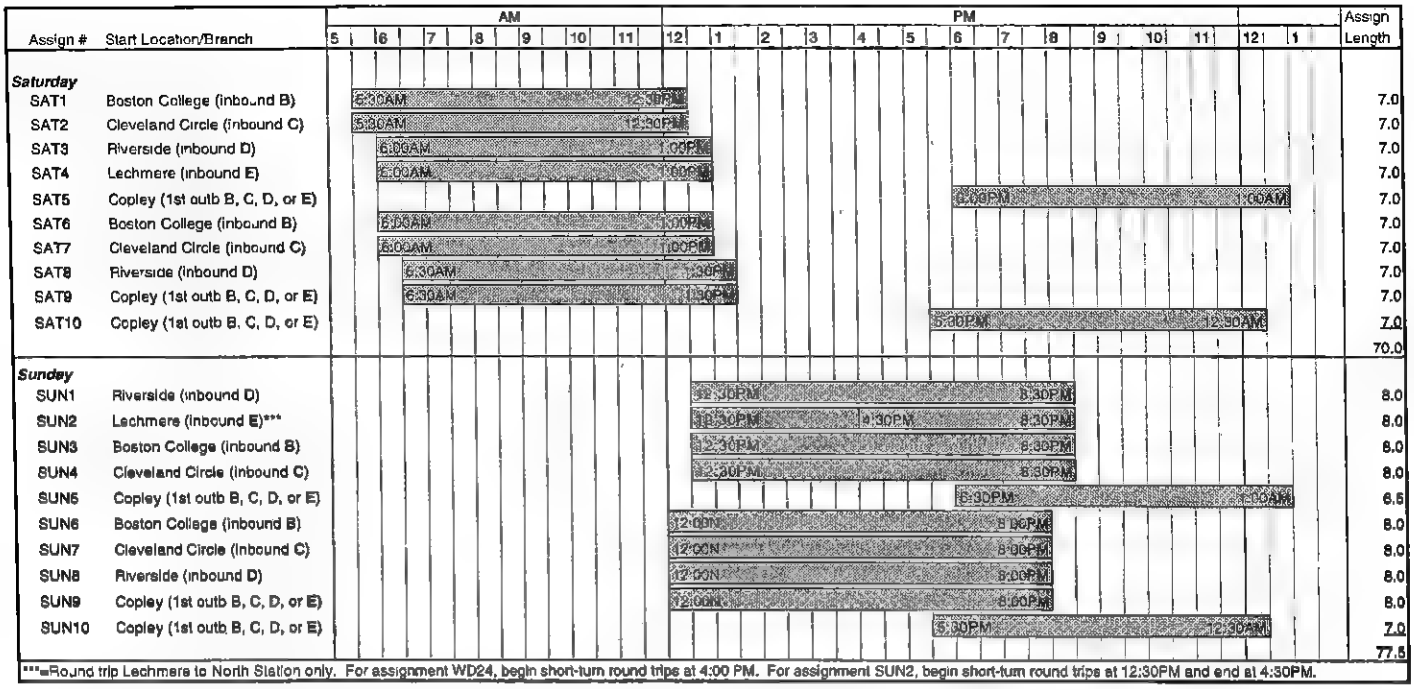


Table A-2 (cont.)
Sample List and Schedule for Surface Green Line



Assign #	Start Location/Branch	Assign Length
Saturday		
SAT1	Boston College (inbound B)	7.0
SAT2	Cleveland Circle (inbound C)	7.0
SAT3	Riverside (inbound D)	7.0
SAT4	Lechmere (inbound E)	7.0
SAT5	Copley (1st outb B, C, D, or E)	7.0
SAT6	Boston College (inbound B)	7.0
SAT7	Cleveland Circle (inbound C)	7.0
SAT8	Riverside (inbound D)	7.0
SAT9	Copley (1st outb B, C, D, or E)	7.0
SAT10	Copley (1st outb B, C, D, or E)	7.0
		70.0
Sunday		
SUN1	Riverside (inbound D)	8.0
SUN2	Lechmere (inbound E)***	8.0
SUN3	Boston College (inbound B)	8.0
SUN4	Cleveland Circle (inbound C)	8.0
SUN5	Copley (1st outb B, C, D, or E)	6.5
SUN6	Boston College (inbound B)	8.0
SUN7	Cleveland Circle (inbound C)	8.0
SUN8	Riverside (inbound D)	8.0
SUN9	Copley (1st outb B, C, D, or E)	8.0
SUN10	Copley (1st outb B, C, D, or E)	7.0
		77.5

***=Round trip Lechmere to North Station only. For assignment WD24, begin short-turn round trips at 4:00 PM. For assignment SUN2, begin short-turn round trips at 12:30PM and end at 4:30PM.

Total shifts = 70 (50 weekday, 10 Saturday, and 10 Sunday)
Total Assignment Hours = 559 (411.5 weekday, 70 Saturday, and 77.5 Sunday)
All assignments require two persons; therefore total person-hours = 1,118 (823 weekday, 140 Saturday, and 155 Sunday)
Assuming each assignment equals one person-day, then total person-days = 140 (100 weekday; 20 Saturday; 20 Sunday)

Table A-3.1
Weekday Sample List and Schedule
for Bus and Trackless Trolley

Day	Route	Direction	Time	Garage
WEEKDAY	1.0	1	5:10 AM	CABOT
WEEKDAY	1.0	1	10:48 AM	CABOT
WEEKDAY	1.0	1	4:37 PM	CABOT
WEEKDAY	1.0	1	9:35 PM	CABOT
WEEKDAY	1.0	0	6:10 AM	CABOT
WEEKDAY	1.0	0	3:57 PM	CABOT
WEEKDAY	1.0	0	10:07 PM	CABOT
WEEKDAY	7.1	1	8:40 AM	CABOT
WEEKDAY	7.1	0	4:45 PM	CABOT
WEEKDAY	7.2	1	8:25 PM	CABOT
WEEKDAY	7.3	1	5:19 PM	CABOT
WEEKDAY	9.0	1	2:00 PM	ALBANY
WEEKDAY	9.0	1	9:55 PM	CABOT
WEEKDAY	9.0	0	2:12 PM	ALBANY
WEEKDAY	9.0	0	9:55 PM	CABOT
WEEKDAY	10.9	1	7:00 PM	CABOT
WEEKDAY	10.9	0	1:20 PM	CABOT
WEEKDAY	10.9	0	5:28 PM	CABOT
WEEKDAY	10.9	0	6:53 PM	CABOT
WEEKDAY	11.3	1	8:26 AM	CABOT
WEEKDAY	11.3	1	4:48 PM	CABOT
WEEKDAY	11.3	1	6:24 PM	CABOT
WEEKDAY	15.1	1	8:30 PM	CABOT
WEEKDAY	16.5	0	9:18 AM	CABOT
WEEKDAY	17.0	0	11:50 AM	CABOT
WEEKDAY	17.0	0	7:00 PM	CABOT
WEEKDAY	18.0	0	1:00 PM	CABOT
WEEKDAY	19.0	0	8:08 AM	CABOT
WEEKDAY	21.0	0	7:50 PM	CABOT
WEEKDAY	22.0	0	8:35 AM	CABOT
WEEKDAY	22.0	0	1:41 PM	CABOT
WEEKDAY	23.0	1	11:20 AM	CABOT
WEEKDAY	23.0	1	11:10 PM	CABOT
WEEKDAY	23.0	0	7:35 AM	CABOT
WEEKDAY	23.0	0	7:40 AM	CABOT
WEEKDAY	23.0	0	4:00 PM	CABOT
WEEKDAY	26.1	0	5:30 PM	Bartlett
WEEKDAY	26.1	0	5:44 PM	Bartlett

Table A-3.1 (cont.)
Weekday Sample List and Schedule
for Bus and Trackless Trolley

Day	Route	Direction	Time	Garage
WEEKDAY	28.0	1	9:12 AM	Bartlett
WEEKDAY	28.0	0	7:41 AM	Bartlett
WEEKDAY	28.0	0	4:28 PM	Bartlett
WEEKDAY	28.0	0	6:20 PM	Bartlett
WEEKDAY	28.3	0	1:45 PM	Bartlett
WEEKDAY	29.5	0	8:59 AM	Bartlett
WEEKDAY	31.0	1	10:15 AM	Bartlett
WEEKDAY	31.0	0	5:30 AM	Bartlett
WEEKDAY	31.0	0	10:56 AM	Bartlett
WEEKDAY	32.0	0	5:56 AM	Bartlett
WEEKDAY	33.6	1	5:15 PM	Bartlett
WEEKDAY	34.0	1	9:10 PM	Bartlett
WEEKDAY	34.0	0	7:38 AM	Bartlett
WEEKDAY	34.0	0	10:00 AM	Bartlett
WEEKDAY	34.4	0	8:20 AM	Bartlett
WEEKDAY	35.1	0	3:30 PM	Bartlett
WEEKDAY	36.0	1	4:55 AM	Bartlett
WEEKDAY	36.8	1	3:35 PM	Bartlett
WEEKDAY	36.8	0	6:54 AM	Bartlett
WEEKDAY	37.0	1	7:25 PM	Bartlett
WEEKDAY	37.0	0	5:55 AM	Bartlett
WEEKDAY	37.0	0	6:55 PM	Bartlett
WEEKDAY	39.3	0	6:06 PM	Bartlett
WEEKDAY	40.0	1	7:30 AM	Bartlett
WEEKDAY	41.0	1	7:06 AM	Bartlett
WEEKDAY	41.0	0	7:24 AM	Bartlett
WEEKDAY	41.0	0	8:00 PM	Bartlett
WEEKDAY	42.0	1	6:40 AM	Bartlett
WEEKDAY	42.0	1	9:00 PM	Bartlett
WEEKDAY	42.1	0	2:03 PM	Bartlett
WEEKDAY	43.0	1	12:44 PM	CABOT
WEEKDAY	43.0	0	6:29 AM	CABOT
WEEKDAY	43.0	0	3:09 PM	CABOT
WEEKDAY	43.0	0	3:43 PM	CABOT
WEEKDAY	43.0	0	5:55 PM	CABOT
WEEKDAY	44.1	0	6:59 AM	CABOT
WEEKDAY	45.0	0	8:27 AM	CABOT
WEEKDAY	45.0	0	6:24 PM	CABOT

Table A-3.1 (cont.)
Weekday Sample List and Schedule for Bus and Trackless Trolley

Day	Route	Direction	Time	Garage
WEEKDAY	46.0	1	1:00 PM	Bartlett
WEEKDAY	47.0	0	12:20 PM	ALBANY
WEEKDAY	47.0	0	5:36 PM	ALBANY
WEEKDAY	48.0	0	2:43 PM	Bartlett
WEEKDAY	49.0	1	6:00 AM	CABOT
WEEKDAY	49.0	1	7:03 AM	CABOT
WEEKDAY	49.0	1	4:49 PM	CABOT
WEEKDAY	49.0	1	5:13 PM	CABOT
WEEKDAY	49.0	0	2:49 PM	CABOT
WEEKDAY	49.0	0	4:26 PM	CABOT
WEEKDAY	51.0	0	3:13 PM	Bartlett
WEEKDAY	55.0	0	8:50 PM	CABOT
WEEKDAY	57.0	1	6:56 AM	ALBANY
WEEKDAY	57.0	0	11:27 AM	ALBANY
WEEKDAY	57.0	0	3:36 PM	ALBANY
WEEKDAY	57.0	0	8:10 PM	CABOT
WEEKDAY	57.1	0	8:01 AM	ALBANY
WEEKDAY	59.2	1	3:45 PM	ALBANY
WEEKDAY	59.2	0	3:00 PM	ALBANY
WEEKDAY	59.2	0	5:00 PM	ALBANY
WEEKDAY	60.0	1	11:30 PM	CABOT
WEEKDAY	60.0	0	11:50 AM	ALBANY
WEEKDAY	64.0	1	5:31 AM	Som/Charlestown
WEEKDAY	66.6	1	2:20 PM	CABOT
WEEKDAY	66.6	1	7:10 PM	CABOT
WEEKDAY	66.6	0	6:40 AM	CABOT
WEEKDAY	66.6	0	2:09 PM	CABOT
WEEKDAY	69.0	1	1:40 PM	Som/Charlestown
WEEKDAY	69.0	0	7:41 AM	Som/Charlestown
WEEKDAY	70.0	1	5:15 PM	Som/Charlestown
WEEKDAY	71.0	1	8:27 AM	North Cambridge
WEEKDAY	71.0	0	6:17 AM	North Cambridge
WEEKDAY	72.0	1	9:25 PM	North Cambridge
WEEKDAY	73.0	0	5:40 PM	North Cambridge
WEEKDAY	73.1	1	4:23 PM	North Cambridge
WEEKDAY	74.0	0	2:40 PM	Som/Charlestown
WEEKDAY	77.0	1	5:48 AM	Som/Charlestown
WEEKDAY	77.0	1	9:50 AM	Som/Charlestown

Table A-3.1 (cont.)
Weekday Sample List and Schedule
for Bus and Trackless Trolley

Day	Route	Direction	Time	Garage
WEEKDAY	77.1	1	3:50 PM	Som/Charlestown
WEEKDAY	77.1	0	5:57 PM	Som/Charlestown
WEEKDAY	77.3	0	7:38 AM	Som/Charlestown
WEEKDAY	79.0	1	1:05 PM	Som/Charlestown
WEEKDAY	79.0	0	12:15 PM	Som/Charlestown
WEEKDAY	80.0	1	8:30 PM	Som/Charlestown
WEEKDAY	80.0	0	8:25 AM	Som/Charlestown
WEEKDAY	83.1	1	5:30 PM	Som/Charlestown
WEEKDAY	85.0	1	11:20 AM	Som/Charlestown
WEEKDAY	85.0	1	12:05 PM	Som/Charlestown
WEEKDAY	85.0	0	11:00 AM	Som/Charlestown
WEEKDAY	87.2	1	8:38 AM	Som/Charlestown
WEEKDAY	88.0	0	8:50 PM	Som/Charlestown
WEEKDAY	90.0	1	8:05 AM	Charlestown
WEEKDAY	90.0	1	7:30 PM	Charlestown
WEEKDAY	92.3	1	7:50 AM	Charlestown
WEEKDAY	92.3	0	5:10 PM	Charlestown
WEEKDAY	93.1	1	2:30 PM	Charlestown
WEEKDAY	93.1	0	2:39 PM	Charlestown
WEEKDAY	95.0	0	5:15 PM	Fellsway
WEEKDAY	95.0	0	9:30 PM	Charlestown
WEEKDAY	101.3	1	7:30 AM	Fellsway
WEEKDAY	104.0	1	1:25 PM	Charlestown
WEEKDAY	104.0	0	6:22 PM	Charlestown
WEEKDAY	105.1	1	4:00 PM	Fellsway
WEEKDAY	105.1	0	12:35 PM	Fellsway
WEEKDAY	109.0	1	7:46 AM	Charlestown
WEEKDAY	109.0	0	6:41 AM	Charlestown
WEEKDAY	111.5	1	8:06 AM	Charlestown
WEEKDAY	111.5	1	12:40 PM	Charlestown
WEEKDAY	111.5	0	7:22 AM	Charlestown
WEEKDAY	111.5	0	12:20 PM	Charlestown
WEEKDAY	111.5	0	6:38 PM	Charlestown
WEEKDAY	116.4	1	6:50 AM	Lynn
WEEKDAY	136.5	0	6:30 PM	Fellsway
WEEKDAY	210.3	0	8:40 AM	Quincy
WEEKDAY	211.0	1	5:30 PM	Quincy
WEEKDAY	216.0	0	10:40 AM	Quincy

Table A-3.1 (cont.)
Weekday Sample List and Schedule
for Bus and Trackless Trolley

Day	Route	Direction	Time	Garage
WEEKDAY	216.2	0	9:20 PM	Quincy
WEEKDAY	220.3	0	9:00 PM	Quincy
WEEKDAY	220.4	1	5:10 PM	Quincy
WEEKDAY	222.0	0	6:55 AM	Quincy
WEEKDAY	222.0	0	10:30 PM	Quincy
WEEKDAY	225.0	1	5:25 AM	Quincy
WEEKDAY	225.1	1	8:05 AM	Quincy
WEEKDAY	225.1	0	6:55 AM	Quincy
WEEKDAY	230.3	1	6:15 AM	Quincy
WEEKDAY	230.3	1	6:30 PM	Quincy
WEEKDAY	230.3	0	6:10 PM	Quincy
WEEKDAY	236.2	0	11:40 AM	Quincy
WEEKDAY	240.0	1	7:00 AM	Quincy
WEEKDAY	240.0	1	4:20 PM	Quincy
WEEKDAY	240.1	0	2:30 PM	Quincy
WEEKDAY	245.5	0	4:30 PM	Quincy
WEEKDAY	301.1	0	5:12 PM	ALBANY
WEEKDAY	302.0	1	8:07 AM	ALBANY
WEEKDAY	304.0	0	5:06 PM	ALBANY
WEEKDAY	304.0	0	7:48 PM	CABOT
WEEKDAY	325.0	1	5:24 PM	Fellsway
WEEKDAY	352.0	0	6:20 PM	Charlestown
WEEKDAY	426.0	1	7:35 AM	Lynn
WEEKDAY	426.0	0	8:50 AM	Lynn
WEEKDAY	426.0	0	11:30 AM	Lynn
WEEKDAY	450.0	0	3:40 PM	Lynn
WEEKDAY	468.4	0	8:00 AM	Lynn
WEEKDAY	701.0	1	8:45 AM	ALBANY
WEEKDAY	701.0	1	4:00 PM	ALBANY
WEEKDAY	701.0	1	5:30 PM	ALBANY
WEEKDAY	708.0	0	1:15 PM	ALBANY
WEEKDAY	747.0	1	10:50 AM	ALBANY
WEEKDAY	747.0	1	11:10 AM	ALBANY
WEEKDAY	747.0	1	12:30 PM	ALBANY
WEEKDAY	747.0	0	9:00 AM	ALBANY

Table A-3.2
Weekend Sample List and Schedule
for Bus and Trackless Trolley

Day	Route	Direction	Time	Garage
Saturday	1.0	0	6:10 AM	Cabot
Saturday	1.0	0	12:12 PM	Cabot
Saturday	17.0	0	11:50 AM	Cabot
Saturday	23.0	1	8:20 PM	Cabot
Saturday	23.0	0	12:50 PM	Cabot
Saturday	31.0	0	11:19 AM	Bartlett
Saturday	39.3	1	8:14 PM	Bartlett
Saturday	42.0	1	5:50 PM	Bartlett
Saturday	42.0	0	5:14 PM	Bartlett
Saturday	43.0	0	11:01 PM	Cabot
Saturday	46.0	0	3:15 PM	Bartlett
Saturday	47.0	1	7:30 PM	Cabot
Saturday	57.0	1	9:35 AM	Cabot
Saturday	62.4	0	5:00 PM	Som/Charlestown
Saturday	66.6	0	4:00 PM	Cabot
Saturday	77.0	1	6:40 PM	Som/Charlestown
Saturday	77.0	0	9:42 AM	Som/Charlestown
Saturday	78.1	1	6:40 PM	Som/Charlestown
Saturday	88.0	1	9:40 PM	Som/Charlestown
Saturday	130.0	1	3:45 PM	Charlestown
Saturday	400.0	1	9:05 PM	Lynn
Saturday	435.2	0	10:30 AM	Lynn
Saturday	450.0	0	11:30 AM	Lynn
Saturday	450.0	0	12:20 PM	Lynn
Saturday	455.0	0	8:30 AM	Lynn
Sunday	9.0	0	11:00 AM	Cabot
Sunday	16.3	0	9:20 AM	Cabot
Sunday	16.3	0	8:40 PM	Cabot
Sunday	28.0	1	2:10 PM	Bartlett
Sunday	28.0	0	2:40 PM	Bartlett
Sunday	39.3	1	9:20 PM	Bartlett
Sunday	72.1	1	7:10 PM	Som/Charlestown
Sunday	72.1	0	1:25 PM	Som/Charlestown
Sunday	88.0	1	6:12 PM	Som/Charlestown
Sunday	100.3	0	6:33 AM	Charlestown
Sunday	101.0	1	5:50 AM	Charlestown
Sunday	134.7	0	7:05 AM	Charlestown
Sunday	238.8	1	12:30 PM	Quincy

Appendix B:
Sample Records and Statistical Calculations

This appendix contains listings of the individual station and trip records that were used to determine fare category proportions as well as average fares, and the spreadsheets with the statistical calculations. For rapid transit and the subway Green Line, each record represents a specific location that was sampled for a specific time period. For surface Green Line and bus/trackless trolley, each record represents one sampled vehicle trip. The tables are as follows:

Table B-1.1	Station Sample Records for Heavy Rail and Subway Green Line (2 pages)
Table B-1.2	Statistical Calculations for Rapid Transit, Subway Green Line and the Heavy Rail System (3 pages)
Table B-2.1	Trip Sample Records: Weekday Surface Green Line - B Inbound (2 pages)
Table B-2.2	Trip Sample Records: Weekend Surface Green Line - B Inbound
Table B-2.3	Trip Sample Records: Weekday Surface Green Line - B Outbound (3 pages)
Table B-2.4	Trip Sample Records: Weekend Surface Green Line - B Outbound
Table B-3.1	Trip Sample Records: Weekday Surface Green Line - C Inbound (2 pages)
Table B-3.2	Trip Sample Records: Weekend Surface Green Line - C Inbound
Table B-3.3	Trip Sample Records: Weekday Surface Green Line - C Outbound (4 pages)
Table B-3.4	Trip Sample Records: Weekend Surface Green Line - C Outbound
Table B-4.1	Trip Sample Records: Weekday Surface Green Line - D Inbound (2 pages)
Table B-4.2	Trip Sample Records: Weekend Surface Green Line - D Inbound

Table B-1.1
Station Sample Records for Heavy Rail and Subway Green Line

						Turnstile				Collector's Turnstile									Total	
No.	GL	Station	Date	Day	SchTbeg.	Token	Pass	PAX	Rev.	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	PAX	Used FB	All PAX	All FB
100	1	COPL	6/30/96	1	14:00	272	489	761	231.2	0	30	16	5	0	20	0	71	3 70	832	234.90
39	1	GOVT	6/9/96	1	14:30	760	179	939	646	0	0	22	27	0	84	0	133	13.50	1072	659.50
102	1	KENM	6/30/96	1	13.00	70	300	370	59.5	0	19	11	8	0	11	0	49	5.00	419	64.50
40	1	PARK	6/9/96	1	18.00	211	53	264	179.35	40	12	7	7	0	18	0	84	35.39	348	214.74
4	1	NSTA	6/3/96	2	22:30	2367	349	2716	2011.95	0	0	0	0	0	0	0	0	0.00	2716	2011 95
6	1	PARK	6/3/96	2	23:00	102	42	144	86.7	3	2	0	1	0	6	0	12	2 73	156	89 43
5	1	PARK	6/3/96	2	17:30	548	303	851	465.8	0	2	1	1	1	36	2	43	0.56	894	466.36
8	1	BOYL	6/4/96	3	19:30	46	69	115	39.1	1	0	6	0	0	23	0	30	1.90	145	41.00
9	1	COPL	6/4/96	3	14:00	364	168	532	309.4	0	2	36	9	35	10	2	94	10.00	626	319.40
66	1	COPL	6/18/96	3	14:00	781	401	1182	663.85	0	59	35	44	27	0	0	165	22.79	1347	686 64
10	1	HAYM	6/4/96	3	20:30	137	150	287	116.45	0	0	12	0	0	2	0	14	2.22	301	118 67
11	1	HYNE	6/4/96	3	16:30	813	422	1235	691.05	0	1	21	3	7	16	0	48	5.30	1283	696.35
14	1	KENM	6/5/96	4	14:30	232	383	615	197.2	0	2	33	10	15	13	0	73	9 82	688	207.02
16	1	PARK	6/5/96	4	16:00	5084	2765	7849	4321.40	0	138	181	97	0	54	5	475	69.48	8324	4390 88
22	1	GOVT	6/6/96	5	19:30	855	372	1227	726 75	0	0	21	0	2	42	0	65	3.89	1292	730.64
79	1	GOVT	6/20/96	5	9.30	224	413	637	190.4	0	11	29	7	1	1	0	49	7.97	686	198.37
80	1	NSTA	6/20/96	5	6:30	1834	1964	3798	1558.9	0	42	57	12	10	10	0	131	12.80	3929	1571.70
25	1	GOVT	6/7/96	6	14:30	3937	584	4521	3346 45	0	0	94	11	5	27	0	137	23.30	4658	3369.75
30	1	ARLN	6/8/96	7	14:00	678	933	1611	576.3	0	11	7	9	2	13	2	44	4.63	1655	580.93
96	1	GOVT	6/29/96	7	10:00	206	62	268	175.1	0	18	26	19	0	7	0	70	11.30	338	186.40
33	1	HAYM	6/8/96	7	19:30	266	128	394	226.1	0	6	19	11	0	6	3	47	6.80	441	232.90
34	1	HYNE	6/8/96	7	16:30	746	215	961	634.1	0	6	20	18	0	4	0	48	12.00	1009	646 10
36		AIRP	6/9/96	1	20:30	269	236	505	228.65	0	7	9	1	0	6	0	23	2.10	528	230.75
37		CENT	6/9/96	1	16:30	351	278	629	298.35	5	90	31	5	0	7	0	138	11.53	767	309.88
38		DAVS	6/9/96	1	14:00	156	27	183	132.6	0	34	18	11	0	8	0	71	7.41	254	140.01
101		DTXG	6/30/96	1	11:00	58	26	84	49.3	0	5	8	7	0	5	0	25	4.08	109	53.38
103		MALD	6/30/96	1	12:30	357	174	531	303 45	0	24	43	11	0	0	0	78	10.80	609	314.25
104		ORNT	6/30/96	1	9:30	72	88	160	61.2	0	17	26	8	0	0	0	51	8.05	211	69.25
105		PORT	6/30/96	1	8:00	53	94	147	45.05	0	20	31	8	0	18	0	77	8.71	224	53.76
106		RUGG	6/30/96	1	16:00	106	52	158	90.1	2	21	22	4	0	27	0	76	7.65	234	97.75
107		STAT	6/30/96	1	15:45	265	378	643	225.25	0	56	37	43	0	0	0	136	18.60	779	243 85
2		AIRP	6/3/96	2	18:30	440	305	745	374	0	0	5	0	0	2	0	7	0.93	752	374.93
3		ANDR	6/3/96	2	21:00	84	49	133	71.4	0	4	3	4	0	3	2	16	2.04	149	73.44
67		FLDS	6/18/96	2	6:30	179	523	702	152.15	0	10	66	55	135	10	0	276	32.61	978	184.76
42		FORE	6/10/96	2	18:30	1332	2740	4072	1132.2	0	33	167	23	327	53	5	608	39.46	4680	1171.66
43		MALD	6/10/96	2	9:30	429	343	772	364.65	0	11	59	16	2	10	4	102	18.30	874	382.95
44		NEMC	6/10/96	2	15:30	261	810	1071	221.85	0	10	38	29	36	28	0	141	19.80	1212	241.65
45		STAT	6/10/96	2	16:00	426	1395	1821	362.1	0	31	81	30	8	7	6	163	28.30	1984	390.40
7		ARLN	6/4/96	3	14:30	256	473	729	217.6	0	0	38	9	6	15	0	68	12.30	797	229.90
62		ASHM	6/18/96	3	11:30	369	89	458	313.65	0	9	92	36	37	19	8	201	30.38	659	344 03
63		BBAY	6/18/96	3	9:30	157	384	541	133.45	7	6	31	4	4	7	0	59	13.07	600	146.52
64		BBAY	6/18/96	3	14:30	456	1000	1456	387.6	15	53	14	6	20	5	6	119	18.93	1575	406 53
47		CCOL	6/11/96	3	6.30	147	325	472	124.95	0	3	0	4	1	4	0	12	1.48	484	126 43
65		CENT	6/18/96	3	8:00	1047	861	1908	889.95	124	44	14	5	18	4	1	210	102.08	2118	992.03
61		DTXG	6/11/96	3	15:30	268	1993	2261	227.8	0	11	50	5	1	15	0	82	11.12	2343	238.92
68		FLDS	6/18/96	3	14:30	152	128	280	129.2	0	22	44	27	13	6	0	112	18.16	392	147.36
48		JACK	6/11/96	3	7:00	244	461	705	207.4	0	29	28	34	152	11	0	254	15.30	959	222.70
69		KEND	6/18/96	3	5:30	179	103	282	152.15	7	5	8	1	0	0	0	21	7.36	303	159.51
70		MASS	6/18/96	3	7:00	220	434	654	187	4	16	21	16	9	6	2	74	13.83	728	200.83
49		RUGG	6/11/96	3	16:00	303	475	778	257.55	4	38	61	11	32	8	0	154	18.60	932	276.15
12		STAT	6/4/96	3	18:00	178	423	601	151.3	0	0	16	11	0	6	0	33	7.40	634	158.70
50		STON	6/11/96	3	10:00	104	128	232	88.4	0	5	32	3	4	3	0	47	5.85	279	94.25
51		SULL	6/11/96	3	9:00	405	193	598	344.25	4	5	50	7	17	17	1	101	15 01	699	359.26
71		ALWF	6/19/96	4	6:30	2826	1888	4714	2402.1	48	27	52	13	21	4	0	165	52.25	4879	2454.35
52		ANDR	6/12/96	4	7:00	636	373	1009	540.6	0	33	55	14	186	8	0	296	15 38	1305	555.98
72		ASHM	6/19/96	4	7.00	1847	1123	2970	1569.95	0	225	126	85	313	47	0	796	54.84	3766	1624.79

Table B-1.1 (cont.)
Station Sample Records for Heavy Rail and Subway Green Line

						Turnstile				Collector's Turnstile									Total	
No.	GL	Station	Date	Day	SchTbeg.	Token	Pass	PAX	Rev.	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	PAX	Used FB	All PAX	All FB
53		BEAC	6/12/96	4	12:30	54	17	71	45.9	3	0	3	0	0	4	0	10	2.92	81	48 82
73		CENT	6/19/96	4	16:30	681	389	1070	578.85	56	51	45	8	8	2	0	170	55.39	1240	634.24
74		JFKU	6/19/96	4	14:30	1096	550	1646	931.6	0	56	103	138	89	35	0	421	70.22	2067	1001 82
15		MALD	6/5/96	4	21:00	31	76	107	26.35	0	0	14	3	0	0	0	17	3 71	124	30 06
1		NQCY	5/6/96	4	17.30	114	194	308	96.9	31	18	22	16	3	1	0	91	32.67	399	129.57
55		ORNT	6/12/96	4	10:00	179	103	282	152.15	10	6	24	0	0	8	0	48	12.32	330	164 47
75		PORT	6/19/96	4	14:00	273	80	353	232.05	17	18	25	8	10	1	0	79	20.98	432	253.03
17		QADM	6/5/96	4	20:30	22	15	37	37.4	4	1	1	0	1	0	0	7	6.48	44	43.88
56		WOND	6/12/96	4	7:00	1724	1449	3173	1465.4	27	20	41	7	8	5	0	108	31.45	3281	1496.85
57		AQUA	6/13/96	5	15.30	751	775	1526	638.35	21	63	49	29	22	2	0	186	37.10	1712	675 45
77		BOYL	6/20/96	5	12.30	88	102	190	74.8	0	12	40	3	1	0	0	56	6.15	246	80 95
78		BRNT	6/20/96	5	9:30	220	54	274	374	55	25	34	12	8	10	0	144	102.90	418	476.90
20		DTXG	6/6/96	5	11:00	335	151	486	284.75	0	4	30	7	51	14	0	106	8 15	592	292.90
21		DTXG	6/6/96	5	15:30	1399	566	1965	1189.15	0	7	70	33	145	38	11	304	28.20	2269	1217.35
23		HARV	6/6/96	5	22:30	654	253	907	555.9	0	0	38	0	0	51	0	89	7.04	996	562.94
		MAVE	6/13/96	5	5:30	1596	109	1705	1356 6	104	38	43	0	17	0	0	202	89.85	1907	1446.45
		MAVE	6/13/96	5	8:00	993	129	1122	844.05	92	34	26	12	5	1	0	170	81.70	1292	925.75
26		QCTR	6/7/96	5	8:00	767	291	1058	1303.9	56	50	257	12	18	74	2	469	145.25	1527	1449.15
81		WOLL	6/20/96	5	6:30	366	956	1322	311.1	12	123	65	47	45	5	0	297	38.91	1619	350.01
24		BEAC	6/7/96	6	7:00	724	577	1301	615.4	2	0	22	9	4	6	0	43	8.99	1344	624.39
82		DAVS	6/21/96	6	6:30	402	1104	1506	341.7	47	88	86	49	9	11	2	292	71.10	1798	412.80
83		HARV	6/21/96	6	6:30	1843	1505	3348	1566.55	2	43	106	10	0	20	0	181	24.92	3529	1591.47
84		HARV	6/21/96	6	11:00	755	196	951	641.75	0	27	67	30	17	5	0	146	23.53	1097	665.28
85		HARV	6/21/96	6	15:30	2131	1054	3185	1811.35	0	87	193	52	22	10	0	364	55.02	3549	1866.37
86		NQCY	6/21/96	6	9:00	156	304	460	132.6	0	17	43	12	1	0	0	73	9.05	533	141.65
87		PORT	6/21/96	6	9:00	111	279	390	94.35	37	7	57	26	2	4	0	133	49.33	523	143.68
59		QADM	6/14/96	6	5:30	2380	1820	4200	4046	33	68	22	3	18	8	0	152	53.30	4352	4099.30
60		QCTR	6/14/96	6	14:00	244	184	428	414.8	73	51	65	15	23	5	0	232	138.81	660	553.61
27		REVE	6/7/96	6	17:00	101	71	172	85.85	0	0	17	5	1	2	0	25	5.80	197	91.65
88		SSTA	6/21/96	6	15:00	4271	2258	6529	3630.35	0	74	170	11	14	60	0	329	35.57	6858	3665.92
28		STAT	6/7/96	6	14:00	1234	2026	3260	1048.9	0	5	53	7	0	13	3	81	12.41	3341	1061.31
29		AQUA	6/8/96	7	17:00	506	266	772	430.1	0	0	22	26	0	8	0	56	13.71	828	443.81
89		ASHM	6/22/96	7	11:00	338	109	447	287.3	0	9	76	30	6	8	18	147	25.20	594	312.50
31		BBAY	6/8/96	7	14:30	366	492	858	311.1	141	112	52	20	0	34	0	359	132.56	1217	443.66
94		BOYL	6/29/96	7	13:00	60	61	121	51	0	12	26	3	0	3	0	44	5.56	165	56.56
90		CENT	6/22/96	7	8:00	278	133	411	236.3	2	2	105	9	0	8	0	126	24.36	537	260.66
91		CHAS	6/22/96	7	12:30	293	275	568	249.05	0	7	33	7	0	1	0	48	7.40	616	256.45
92		DTXG	6/22/96	7	15:30	1010	294	1304	858.5	0	41	58	52	0	0	0	151	30.01	1455	888.51
95		DTXG	6/29/96	7	11:00	294	174	468	249.9	2	9	87	6	0	5	0	109	22.71	577	272.61
32		HARV	6/8/96	7	22:15	692	251	943	588.2	0	26	27	7	0	22	14	96	7.60	1039	595.80
35		MALD	6/8/96	7	21:00	103	57	160	87.55	0	6	11	6	0	6	0	29	4.26	189	91.81
97		MASS	6/29/96	7	7:00	57	80	137	48.45	0	10	10	2	0	1	0	23	2.59	160	51.04
98		MAVE	6/29/96	7	5:30	97	213	310	82.45	0	0	11	0	0	2	0	13	2.04	323	84.49
93		STAT	6/22/96	7	14:00	124	220	344	105.4	0	3	24	8	0	5	0	40	7.60	384	113.00
99		SULL	6/29/96	7	8:00	335	145	480	284.75	4	18	46	8	0	4	0	80	14.64	560	299.39

Table B-1.2
Statistical Calculations for Rapid Transit, Subway Green Line and the Heavy Rail System

Turnstile:

		Sum		PAX	FB
Weekday	subw. GL	17324	8385	25709	14725.4
	Rapid Transit	38640	34656	73296	35932.05
Weekend	subw. GL	3209	2359	5568	2727.65
	Rapid Transit	6240	4123	10363	5304

		Fare-Mix		Av. FB Dep
Weekday	subw. GL	0.3262	0.6738	0.5728
	Rapid Transit	0.4728	0.5272	0.4902
Weekend	subw. GL	0.4237	0.5763	0.4899
	Rapid Transit	0.3979	0.6021	0.5118

	Sum		PAX	FB
Weekday	55964	43041	99005	50657.45
Weekend	9449	6482	15931	8031.65

		Fare-Mix		Av. FB Dep.
unweighted	Weekday	0.4347	0.5653	0.5117
	Weekend	0.4069	0.5931	0.5042
weighted:	Weekday	0.4359	0.5641	0.5110
	Weekend	0.40436	0.5956	0.5063
HR System:	Weekday	0.4628	0.5372	0.4959
	Weekend	0.3996	0.60038	0.5103

Collector's Turnstile:

Sum						PAX	FB
4	259	526	195	103	249	1336	172.75444
895	1623	2982	1012	1884	746	9142	1823 984
40	102	128	104	2	170	546	92.31993
156	529	813	282	6	210	1996	379.16393

Fare-Mix						Av. FB Dep.
0.0030	0.1939	0.3937	0.1460	0.0771	0.18638	0.1293
0.0979	0.17753	0.3262	0.1107	0.2061	0.0816	0.19952
0.0733	0.1868	0.23443	0.19048	0.0037	0.31136	0.1691
0.0782	0.2650	0.4073	0.1413	0.0030	0.1052	0.1900

Sum						PAX	FB
899	1882	3508	1207	1987	995	10478	1996.7384
196	631	941	386	8	380	2542	471.48386

Fare-Mix						Av. FB Dep.
0.0858	0.1796	0.3348	0.1152	0.1896	0.0950	0.1906
0.0771	0.2482	0.3702	0.1518	0.0031	0.14949	0.18548
0.0740	0.1816	0.3432	0.1196	0.1736	0.1080	0.1818
0.0769	0.2453	0.3637	0.1537	0.0032	0.1572	0.1847
0.09143	0.1786	0.3308	0.1131	0.1973	0.0687	0.1947
0.0778	0.2597	0.3955352	0.14463	0.0031	0.11926	0.18854

Table B-1.2 (cont.)
Statistical Calculations for Rapid Transit, Subway Green Line and the Heavy Rail System

Subway Green Line & Rapid Transit Results:

		Sum						PAX	FB
Weekday	subw. GL	17328	8644	526	195	103	249	27045	14898.154
	Rapid Transit	39535	36279	2982	1012	1884	746	82438	37756.034
Weekend	subw. GL	3249	2461	128	104	2	170	6114	2819.9699
	Rapid Transit	6396	4652	813	282	6	210	12359	5683.1639

Av. PAX	STDEV	COV	Av. FB	STDEV	COV	Correl.
1507.23	1920.146	1.2740	805.37	1116.62	1.386	0.970
1199 96	1286.39	1.072	549 86	728.14	1.324	0.8868
1931 79	2303 10	1.192	1064 154	1336.33	1 256	0.970
1472.11	1427.19	0.969	674.21	825.39	1.224	0.876
764.250	467.71	0.612	352.50	236.12	0.670	0.812
537.348	356.77	0.6640	247.09	203.446	0.823	0.946

		Fare-Mix						Precision	Av. FB Dep.
Week	subw. GL	0.6206	0.3349	0.0197	0.0090	0.0032	0.0126	14.97	0.5329
	Rapid Transit	0.48452	0.4318	0.0400	0.0137	0.0199	0.0101	13.83	0.45836
Weekday	subw. GL	0.6407	0.3196	0.019449	0.0072	0.0038	0.0092	17.06	0.5509
	Rapid Transit	0.4796	0 4401	0.0362	0.0123	0.0229	0.0090	15 930	0.4580
Weekend	subw. GL	0.53140	0.40252	0.0209	0.0170	0.0003	0.0278	30.952	0.4617
	Rapid Transit	0.51752	0.37641	0.0658	0.0228	0.00049	0.0170	12.31	0.4598

Heavy Rail Results:

	Split	Survey	RT System	Percent	Weight	Percent
GL	0.7830	27,101,263	5,879,819	0.0681	27,101,263	0.2521
RT	0.2170	80,415,873	80,415,873	0.9319	80,415,873	0.7479

Av. PAX	STDEV	COV	Av. FB	STDEV	COV	Correl.
1266.89	1442.6546	1.139	605.518	828.62	1.3685	0.9187
1853.13	1630.11	0.880	752.20	950.88	1.264	0.941
595.90	393.16	0.660	274 29	213.45	0.778	0.906

GL:	COVpax	COV rev	COV cor	RT:	COVpax	COV rev	COV cor
	0.00052196	0.000817623	-0.0012674		0.012203	0.018110	-0.0263667
	0.000778181	0.001205807	-0.0018797		0.013974	0.021511	-0.0303836
	0.000415401	0.000500407	-0.0007408		0.015726	0.024170	-0.0369004
	0.006525398	0.009543228	-0.0153100		0.007181	0.009950	-0.0149921
	0.009546232	0.013580558	-0.0220943		0.008069	0.011404	-0.0168106
	0.00491502	0.005912586	-0.0087596		0.008758	0.013442	-0.0205369

		Sum						PAX	FB
	Week	66508	52036	4449	1593	1995	1375	127956	61157.32
	Weekday	56863	44923	3508	1207	1987	995	109483	52654.188
	Weekend	9645	7113	941	386	8	380	18473	8503.1339

		Fare-Mix						Precision	Av. FB Dep.
unweighted:	Week	0.5198	0.4067	0.0348	0.012450	0.0156	0.0107	10.88	0.4780
	Weekday	0.51938	0.4103	0.0320	0.0110	0.0181	0.0091	12.53	0.4809
	Weekend	0.5221	0.3850	0.0509	0.0209	0.00043	0.0206	12.03	0.4603
weighted:	Week	0.5188	0.40736	0.0349	0.01248	0.0157	0.0107	10.550	0.4772
	Weekday	0.5202	0.4097	0.0320	0.0110	0.0181	0.0091	11.91	0.48140
	Weekend	0.5210	0.3830	0.05448	0.02135	0.0004	0.0197	11.97	0.4602
HR System:	Week	0.4938	0.4252	0.0386	0.0133	0.0188	0.0103	12.42	0.4634438
	Weekday	0.4906	0.4319	0.0350	0.0119	0.0216	0.0091	14.142	0.4643
	Weekend	0.51846	0.3782	0.0627	0.02242	0.00047	0.0177	11.0351	0.4599

Table B-2.1
Trip Sample Records: Weekday Surface Green Line - B Inbound

Rec No	Probl.	Rte	No	Dir.	Obs	Rec	Day	Date	Time	Veh No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor.	Calc. of Fare Evation		Av. FB	n
30050		D	812	1	BARRETT	ANDON	4	5/22/96	5:00	3660B	1	3345300	3346670	0	21	35	2	0		1		56	59	13.7	18.25	YES	18.25	1076.75	13.7	18.25	0.309	1
30075		B	812	1	SASSO	ANDON	6	5/10/96	5:01	3629A	1	3186931	3188361	0	14	20	4	0				49	55	14.3	16.1	YES	16.10	885.50	14.3	16.1	0.293	2
30055		B	812	1	DEMPSEY	BARRETT	4	5/29/96	5:34	3604A	1	2644657	2645582	0	12	16	2	0				35	38	9.25	12.7	YES	12.70	482.60	9.25	12.7	0.334	3
30066		B	812	1	DEMPSEY	BARRETT	5	5/30/96	5:34	3691A	1	1261073	1261896	0								28	30	8.25	10.6	YES	10.60	318.00	8.25	10.6	0.353	4
														Sum	65	106	8	2	0	1	0	Mean	45.5				14.41	0.317			0.322	4
														%	0.357	0.582	0.044	0.011	0.000	0.005	0.000	STDEV	13.8				3.418	46.592			0.027	4
														182								COV	0.30				0.24	0.16			0.08	4
																						Tolerance	31.8				24.9	0.99			8.7	4
30078		B	812	1	DONOHOE	ANDON	6	5/31/96	6:25	3691A	2	1288628	1289208	0	10	24	2	1	3			39	40	5.8	9.3	YES	9.30	372.00	5.8	9.3	0.233	1
30061		D	812	1	DOOLAN	ANDON	5	5/9/96	6:30	3606A	1	2607615	2608335	0	12	24	1	1	3			32	41	7.2	10.8	YES	10.80	442.80	7.2	10.8	0.263	2
30088		D	812	1	SASSO	ANDON	6	4/19/96	6:30	3685A	2	3579065	3579745	0	12	7	0	0				17	19	6.8	10.2	YES	10.20	193.80	6.8	10.2	0.537	3
30052		D	812	1	BARRETT	DOOLAN	4	4/24/96	6.40	3696A	2	680565	680755	0	2		1	0		1		25	4	1.9	1.9	YES	1.90	7.60	1.9	1.9	0.475	4
30072		D	812	1	BARRETT	DOOLAN	6	4/19/96	7:20	3531B	2	1707760	1709220	0	22	61	2	0				62	85	14.6	19.1	YES	19.10	1623.50	14.6	19.1	0.225	5
30068		B	812	1	DOOLAN	BARRETT	5	5/16/96	7:40	3604B	2	883765	884903	0	26	69	2	0	1			92	98	11.38	22.5	YES	22.50	2205.00	11.38	22.5	0.230	6
30070		D	812	1	DONOHOE	DEMPSEY	6	5/10/96	7:50	3518A	1	2162354	2164241	1	31	48	4	0		1		63	84	19.87	27.15	YES	27.15	2280.60	19.87	27.15	0.323	7
30049		B	812	1	BARRETT	ANDON	4	5/22/96	8:01	3673A	2	2709512	2711397	1	37	98	1	0		1		135	137	19.85	31.65	YES	31.65	4336.05	19.85	31.65	0.231	8
30076		D	812	1	SASSO	ANDON	6	5/10/96	8:04	3442B	1	1680640	1683282	0	34	77	3	10	5			115	129	26.42	33.5	YES	33.50	4321.50	26.42	33.5	0.260	9
30602		D	812	1	ANDON	DONOHOE	6	5/31/96	8:42	3660B	2	1200	1232	1	14	26	0	0				37	40	1.32	11.9	NO	11.90	476.00			0.298	10
30064		B	812	1	DONOHOE	ANDON	5	5/30/96	8:57	3448B	2	1898401	1900274	1	25	44	4	2		1		65	76	19.73	22.85	YES	22.85	1736.60	19.73	22.85	0.301	11
														Sum	225	478	20	14	12	4	0	Mean	68.5				18.26	0.267			0.307	11
														%	0.299	0.635	0.027	0.019	0.016	0.005	0.000	STDEV	43.3				10.195	424.625			0.105	11
														753								COV	0.63				0.56	0.19			0.34	11
																						Tolerance	40.1				35.4	0.96			21.6	11
30056		D	812	1	DEMPSEY	BARRETT	4	5/29/96	9:05	3517A	2	1125348	1126153	0	13	12	2	0				21	27	8.05	11.45	YES	11.45	309.15	8.05	11.45	0.424	1
30601		D	812	1	DEMPSEY	DONOHOE	6	5/10/96	9:08	3444A	2	151433	151568	0	23	33	1	0	1			54	58	1.35	19.75	NO	19.75	1145.50			0.341	2
30067		D	812	1	DEMPSEY	BARRETT	5	5/30/96	9:10	3446A	1	67115	68470	0	18	16	4	0				27	38	13.55	16.1	YES	16.10	611.80	13.55	16.1	0.424	3
30077		B	812	1	DEMPSEY	BARRETT	6	5/31/96	9:10	3610B	1	3425999	3426609	1	16	21	5	0				33	42	7.1	14.6	NO	14.60	613.20			0.348	4
30054		B	812	1	ANDON	DONOHOE	4	5/29/96	9:15	3412A	2	1914189	1915809	0	25	32	2	0				54	59	16.2	21.65	YES	21.65	1277.35	16.2	21.65	0.367	5
30057		B	812	1	BARRETT	ANDON	4	5/22/96	9:35	3441B	2	1773931	1775121	1	17	19	5	0		1		32	42	12.9	15.45	YES	15.45	648.90	12.9	15.45	0.368	6
30074		B	812	1	BARRETT	DOOLAN	6	5/10/96	9:55	3605A	1	2208767	2210727	1	29	14	2	0	2			33	47	20.6	25.05	YES	25.05	1177.35	20.6	25.05	0.533	7
30069		D	812	1	ANDON	DEMPSEY	5	5/16/96	10:20	36021	1	2085827	2086287	1	32	32	11	0		1	1	54	77	25.6	29.4	YES	29.40	2263.80	25.6	29.4	0.382	8
30047		B	812	1	DONOHOE	DOOLAN	4	5/15/96	10:37	3442B	2	1689495	1690720	0	13	21	7	0	8	1		35	90	12.25	12.45	YES	12.45	622.50	12.25	12.45	0.249	9
30053		B	812	1	DEMPSEY	ANDON	4	4/24/96	10:53	3625A	2	1383569	1386416	2	41	43	4	0	3	1		68	92	30.47	35.65	YES	35.65	3279.80	30.47	35.65	0.388	10
30087		B	812	1	DEMPSEY	ANDON	4	5/15/96	10:53	3601A	2	1563386	1563596	0	6	12	0	0	2			18	20	2.1	5.1	NO	5.10	102.00			0.255	11
30063		B	812	1	DONOHOE	DEMPSEY	5	5/9/96	10:53	3655A	2	1861754	1863089	1	19	17	2	0				27	38	14.35	16.55	YES	16.55	628.90	14.35	16.55	0.436	12
30048		D	812	1	BARRETT	SASSO	4	5/15/96	11:00	3612B	2	2229616	2232956	1	46	30	3	0		1		67	80	34.4	39.7	YES	39.70	3176.00	34.4	39.7	0.496	13
30073		B	812	1	DEMPSEY	DONOHOE	6	4/19/96	11:11	3534B	1	114336	118634	0	67	73	10	2				127	152	42.98	59.75	YES	59.75	9082.00	42.98	59.75	0.393	14
30071		B	812	1	SASSO	ANDON	6	4/19/96	11:33	3678A	1	3540952	3544602	5	58	43	9	1			1	94	112	41.5	51.5	YES	51.50	5768.00	41.5	51.5	0.460	15
30041		B	812	1	SASSO	BARRETT	3	5/21/96	11:57	3658A	2	3087582	3089212	0	24	16	2	0				34	42	16.3	20.8	YES	20.80	873.60	16.3	20.8	0.495	16
30020		B	812	1	SASSO	BARRETT	2	5/13/96	12:30	3455B	2	1773199	1773649	0	8	9	0	0				14	17	4.5	6.8	YES	6.80	115.60	4.5	6.8	0.400	17
30046		B	812	1	DEMPSEY	DONOHOE	3	5/14/96	12:32	3694A	1	1350237	1353137	0	41	29	21	0				83	91	29	39.05	YES	39.05	3553.55	29	39.05	0.429	18
30044		B	812	1	SASSO	BARRETT	3	5/14/96	12:53	3457B	2	2173795	2175460	1	24	28	2	1	11			58	66	17.65	21.2	YES	21.20	1399.20	17.65	21.2	0.321	19
30025		B	812	1	DEMPSEY	ANDON	2	5/20/96	13:34	3660B	2	3309751	3312246	1	33	26	1	1	3	1		58	65	25.95	28.65	YES	28.65	1862.25	25.95	28.65	0.441	20
30037		D	812	1	BARRETT	SASSO	3	4/29/96	13:55	3495A	2	2171027	2173208	0	34	40	4	0	11			72	89	21.81	29.7	YES	29.70	2643.30	21.81	29.7	0.334	21
30045		B	812	1	DONOHOE	DEMPSEY	3	5/14/96	13:56	3473B	1	1898523	1901298	0	35	24	10	0	11			53	80	27.75	31.75	YES	31.75	2540.00	27.75	31.75	0.397	22
30065		B	812	1	BARRETT	DONOHOE	5	4/25/96	13:58	3534B	1	145974	148939	1	43	55	2	4	4	2		78	110	30.65	38.55	YES	38.55	4240.50	30.65	38.55	0.350	23
														Sum	665	645	109	9	56	8	2	Mean	65.0				25.68	0.395			0.393	23
														%	0.445	0.432	0.073	0.006	0.037	0.005	0.001	STDEV	32.9				13.816	434.895			0.070	23
														1494								COV	0.51				0.54	0.11			0.18	23
																						Tolerance	22.2				23.6	0.96			7.9	23

Table B-2.1 (cont.)
Trip Sample Records: Weekday Surface Green Line - B Inbound

Rec. No.	Probl.	Rte	No	Dir	Obs.	Rec	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est	FB OK?	Used FB	Cor.	Calc. of Fare Evation		Av FB	n
30039		B	812	1	DONOHOE	DOOLAN	3	5/21/96	14:04	3600A	2	2565311	2566224	0	8	13	3	1	9			30	34	9.13	7.8	NO	7.80	265.20			0.229	1
30021		B	812	1	BARRETT	SASSO	2	5/13/96	14:05	3442A	1	1280372	1284418	5	51	27	11	2	6	2		70	99	45.46	46.35	YES	46.35	4588.65	45.46	46.35	0.468	2
30040		B	812	1	BARRETT	SASSO	3	5/21/96	14:20	3671A	2	144854	145919	1	15	17	2	0	4			33	38	11.65	13.15	YES	13.15	499.70	11.65	13.15	0.346	3
30038		B	812	1	ANDON	DEMPSEY	3	4/23/96	14:27	3668A	2	1385435	1387509	0	31	28	0	0	3	1		47	63	20.74	26.35	YES	26.35	1660.05	20.74	26.35	0.418	4
30019		B	812	1	DONOHOE	DOOLAN	2	5/13/96	14:36	3646B	1	2259402	2260927	3	25	27	1	0	4	3		35	60	18.25	21.45	YES	21.45	1287.00	18.25	21.45	0.358	5
30059		B	812	1	DEMPSEY	ANDON	4	5/8/96	14:44	3621A	2	2867018	2870224	1	42	31	6	0	2			68	81	33.06	36.9	YES	36.90	2988.90	33.06	36.9	0.456	6
30062		B	812	1	BARRETT	SASSO	5	5/9/96	14.52	3631A	2	2628137	2629652	0	25	13	2	0	1			48	41	15.15	21.65	YES	21.65	887.65	15.15	21.65	0.528	7
30023		B	812	1	DONOHOE	DOOLAN	2	5/20/96	15:05	3660B	2	3312246	3315122	0	39	9	3	0	1	1		45	53	28.76	33.75	YES	33.75	1788.75	28.76	33.75	0.637	8
30051		B	812	1	DONOHOE	DOOLAN	4	5/8/96	15:13	3448A	2	1748302	1749846	1	21	27	1	4	1			62	54	16.44	19.65	YES	19.65	1061.10	16.44	19.65	0.364	9
30022		B	812	1	ANDON	DEMPSEY	2	5/13/96	15:32	3695B	2	2203872	2205597	0	30	22	4	0	1			51	57	17.25	26.3	YES	26.30	1499.10	17.25	26.3	0.461	10
30043		B	812	1	BARRETT	SASSO	3	5/14/96	15:40	3470A	2	1782878	1786218	2	48	31	2	0	2	1		75	84	35.4	41.2	YES	41.20	3460.80	35.4	41.2	0.490	11
														Sum	335	245	35	7	34	8	0	Mean	60.4				26.78	0.444			0.432	11
														%	0.505	0.369	0.053	0.011	0.051	0.012	0.000	STDEV	20.4				11.806	220.679			0.108	11
														664								COV	0.34				0.44	0.13			0.25	11
																						Tolerance	21.4				27.9	0.92			15.8	11
30042		B	812	1	ANDON	DEMPSEY	3	5/21/96	16:37	3517B	2	2071349	2073808	0	35	33	1	0				52	69	24.59	29.95	YES	29.95	2066.55	24.59	29.95	0.434	1
30036		B	812	1	DEMPSEY	ANDON	3	5/28/96	17:10	3423A	2	1733633	1734469	0	14	19	0	0	2	1		32	36	8.3	11.9	YES	11.90	428.40	8.3	11.9	0.331	2
30034		B	812	1	DONOHOE	SASSO	3	5/28/96	17:15	3489A	2	1600285	1601075	0	11	34	1	0	2			43	48	7.9	9.55	YES	9.55	458.40	7.9	9.55	0.199	3
30024		B	812	1	ANDON	DEMPSEY	2	5/20/96	17.40	3688A	2	2423747	2424562	1	12	14	0	1				22	27	9.15	10.6	YES	10.60	286.20	9.15	10.6	0.393	4
30032		B	812	1	SASSO	BARRETT	3	5/7/96	18:00	3606	2	2580703	2580973	1	3	10	2	0	3	1		13	19	3.7	2.95	NO	2.95	56.05			0.155	5
														Sum	75	110	4	1	7	2	0	Mean	39.8				12.99	0.326			0.302	5
														%	0.377	0.553	0.020	0.005	0.035	0.010	0.000	STDEV	19.6				10.089	177.648			0.121	5
														199								COV	0.49				0.78	0.35			0.40	5
																						Tolerance	46.2				72.9	0.90			37.6	5
30035		B	812	1	BARRETT	DOOLAN	3	5/28/96	18:39	3687B	1	3073886	3076046	0	25	29	33	0				45	67	21.6	27.85	YES	27.85	2422.95	21.6	27.85	0.320	1
30060		B	812	1	DEMPSEY	ANDON	4	5/8/96	19:10	3445A	2	2334447	2335042	0	14	32	0	0				37	46	5.95	11.9	YES	11.90	547.40	5.95	11.9	0.259	2
30028		B	812	1	SASSO	DOOLAN	2	4/22/96	19:20	3695A	1	853212	858552	0	47	48	7	0	2			85	104	53.4	41.35	NO	41.35	4300.40			0.398	3
30058		B	812	1	BARRETT	SASSO	4	5/8/96	19:20	3621A	2	2872264	2873419	0	19	6	2	0				23	27	11.55	16.55	YES	16.55	446.85	11.55	16.55	0.613	4
30030		B	812	1	DEMPSEY	DONOHOE	2	5/6/96	20:19	3601A	1	1449639	1451875	0	31	18	2	0				34	51	22.36	26.75	YES	26.75	1364.25	22.36	26.75	0.525	5
30027		B	812	1	BARRETT	ANDON	2	4/22/96	20:30	3495A	2	2161499	2162349	2	16	17	0	0		2		26	35	10.5	13.6	YES	13.60	476.00	10.5	13.6	0.389	6
30026		B	812	1	BARRETT	ANDON	2	5/6/96	21:00	3688B	2	3720666	3721426	0	14	8	0	0				24	22	7.6	11.9	YES	11.90	261.80	7.6	11.9	0.541	7
30033		B	812	1	DEMPSEY	ANDON	3	5/7/96	21:20	3640A	1	2707635	2708786	0	35	17	1	0				46	53	11.51	29.95	NO	29.95	1587.35			0.565	8
30035		B	812	1	DOOLAN	DONOHOE	3	5/7/96	22:16	3431A	1	2585051	2586071	1	40	25	1	0		2		37	68	11.2	34.2	NO	34.20	2325.60			0.503	9
30031		B	812	1	SASSO	DOOLAN	2	5/6/96	22:32	3691B	1	3320369	3322084	0	26	13	2	0				16	41	17.15	22.5	YES	22.50	922.50	17.15	22.5	0.549	10
30029		B	812	1	DEMPSEY	DONOHOE	2	4/22/96	23:31	3698A	1	3161767	3162872	0	19	18	0	0				34	37	11.05	16.15	YES	16.15	597.55	11.05	16.15	0.436	11
														Sum	286	231	48	0	2	4	0	Mean	51.9				22.97	0.443	18.31	23.10	0.463	11
														%	0.501	0.405	0.084	0.000	0.004	0.007	0.000	STDEV	25.3				9.857	213.522	20.7 %		0.112	11
														571								COV	0.49				0.43	0.16			0.24	11
																						Tolerance	30.8				27.2	0.86			15.2	11

Table B-2.2
Trip Sample Records: Weekend Surface Green Line - B Inbound

Rec No.	Probl.	Rte	No.	Dir.	Obs	Rec.	Day	Date	Time	Veh No.	Car	Beg	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor	Calc. of Fare Evation		Av FB	n
30010		D	812	1	BARRETT	DOOLAN	1	4/28/96	12:30	3622D	1	1773642	1775478	3	30	31	4	0	0	6	0	60	71	21.36	26.3	YES	26.30	1867.30	21.36	26.3	0.370	1
30018		D	812	1	DOOLAN	DONOHOE	1	5/12/96	13:20	3688D	1	3827567	3831093	1	57	52	2	3	0	13	0	109	127	36.26	50.05	YES	50.05	6356.35	36.26	50.05	0.394	2
30013		B	812	1	DONOHOE	SASSO	1	4/28/96	14:05	3673B	1	307530	310240	1	40	22	0	0	0	7	0	66	69	28.1	34	YES	34.00	2346.00	28.1	34	0.493	3
30008		D	812	1	DONOHOE	DEMPSEY	1	4/21/96	14:11	3696A	1	645966	647266	0	16	22	0	0	0	0	0	31	38	13	13.6	YES	13.60	516.80	13	13.6	0.358	4
30007		D	812	1	ANDON	DEMPSEY	1	4/28/96	14:20	3654B	1	2509406	2511101	0	19	23	0	0	0	3	0	32	45	16.95	16.15	YES	16.15	726.75	16.95	16.15	0.359	5
30015		B	812	1	ANDON	DEMPSEY	1	5/19/96	15:11	3687B	2	2928360	2928445	0	1	9	0	0	0	0	0	6	10	0.85	0.85	YES	0.85	8.50	0.85	0.85	0.085	6
30481		B	812	1	DEMPSEY	DONOHOE	1	4/21/96	15:30	3663A	1	2940947	2941737	0	14	15	0	0	0	2	0	30	31	7.9	11.9	YES	11.90	368.90	7.9	11.9	0.384	7
30012		B	812	1	DONOHOE	SASSO	1	4/28/96	15:58	3696A	1	755004	758374	2	47	58	8	0	0	10	0	111	123	35.7	41.55	YES	41.55	5110.65	35.7	41.55	0.308	8
30014		D	812	1	ANDON	DEMPSEY	1	4/28/96	16:55	3689B	1	3925071	3929499	0	61	38	3	2	0	4	0	62	108	44.28	53.25	YES	53.25	5751.00	44.28	53.25	0.493	9
30009		D	812	1	DONOHOE	DEMPSEY	1	4/21/96	17:20	3667A	1	3032074	3035194	1	35	29	2	1	0	3	0	59	70	32.2	30.55	NO	30.55	2138.50			0.436	10
30016		D	812	1	BARRETT	ANDON	1	4/21/96	19:40	3654A	1	2747076	2750176	2	40	46	1	0	0	10	0	54	97	33	34.2	YES	34.20	3317.40	33	34.2	0.353	11
30017		B	812	1	BARRETT	ANDON	1	4/21/96	22:24	3661B	1	2659076	2661157	0	31	26	2	0	0	6	0	49	65	20.81	26.75	YES	26.75	1738.75	20.81	26.75	0.412	12
30089		B	812	1	SASO	BARRETT	7	6/11/96	5:24	3663B	1	675311	675704	0	9	11	1	0	0	0	0	20	21	3.93	7.85	YES	7.85	164.85	3.93	7.85	0.374	13
30086		D	812	1	DOOLAN	DONOHOE	7	5/18/96	6:00	3682A	1	1917752	1918262	0	6	24	0	0	0	1	0	27	31	5.1	5.1	YES	5.10	158.10	5.1	5.1	0.165	14
30084		D	812	1	ANDON	DONOHOE	7	5/11/96	7:00	3621A	1	2929669	2930904	0	18	27	3	0	0	1	0	44	49	12.35	15.9	YES	15.90	779.10	12.35	15.9	0.324	15
30085		B	812	1	DEMPSEY	DOOLAN	7	5/11/96	8:20	3640B	1	2736078	2739701	1	53	64	7	2	0	3	0	101	129	37.23	47.25	YES	47.25	6095.25	37.23	47.25	0.366	16
30080		B	812	1	DEMPSEY	DONOHOE	7	4/20/96	9:15	3661B	1	2607502	2610134	2	43	43	10	0	0	0	0	81	96	28.32	38.55	YES	38.55	3700.80	28.32	38.55	0.402	17
30082		B	812	1	DONOHOE	DOOLAN	7	5/18/96	11:38	3446A	2	3431	4531	0	16	17	3	0	0	1	0	32	37	11	14.2	YES	14.20	525.40	11	14.2	0.384	18
30079		B	812	1	SASSO	ANDON	7	4/20/96	18:09	3663A	1	2930986	2934671	2	56	32	1	0	0	1	0	59	90	38.85	47.8	YES	47.80	4302.00	38.85	47.8	0.531	19
30083		B	812	1	BARRETT	SASSO	7	5/18/96	21:52	3661A	1	1866594	1870610	2	57	35	2	0	0	3	0	72	97	42.16	48.85	YES	48.85	4738.45	42.16	48.85	0.504	20
30081		D	812	1	SASSO	ANDON	7	4/20/96	23:35	3698A	1	3110632	3113306	0	45	17	0	0	0	2	0	29	64	26.74	38.25	YES	38.25	2448.00	26.74	38.25	0.598	21
														Sum	[illegible]	641	49	8	0	76	0	Mean	69.9			0.411	28.71	0.411	23.19	28.62	0.387	
														%	0.473	0.437	0.033	0.005	0.000	0.052	0.000	STDEV	35.9				16.443	550.663	18.9 %		0.113	
														1468								COV	0.51				0.57	0.091			0.29	
																						Tolerance	23.5				26.2	0.93			13.4	

Table B-2.3
Trip Sample Records: Weekday Surface Green Line - B Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30467	B	812	0	DONOHOE	ANDON	6	5/31/96	5:36	3639B	1									5		5		1
30441	B	812	0	BARRETT	DOOLAN	4	4/24/96	5:50	3663A	1									14		18		2
30469	B	812	0	SASSO	ANDON	6	4/19/96	5:56	3685A	1									13		23		3

Sum	32
Mean	10.7
STDEV	4.9
COV	0.46
Tolenrance	58.7 %

30454	B	812	0	DOOLAN	ANDON	5	5/9/96	6:04	3688B	1									11		15		1
30459	B	812	0	BARRETT	DOOLAN	6	4/19/96	6:26	3651B	1									18		25		2
30456	B	812	0	DEMPSEY	DONOHOE	5	5/9/96	6:37	3646B	1									35		57		3
30457	B	812	0	DOOLAN	BARRETT	5	5/16/96	7:00	3604B	2									10		48		4
30461	B	812	0	DEMPSEY	DONOHOE	6	5/10/96	7:12	3612A	1									0		16		5
30464	B	812	0	SASSO	ANDON	6	5/10/96	7:22	3602B	2									21		37		6
30452	B	812	0	ANDON	DONOHOE	5	5/30/96	7:58	3535B	1									50		42		7
30468	B	812	0	ANDON	DONOHOE	6	5/31/96	7:58	3500A	2									7		40		8
30444	B	812	0	DEMPSEY	BARRETT	4	5/29/96	8:10	3619A	2									11		23		9
30466	B	812	0	DEMPSEY	BARRETT	6	5/31/96	8:12	3543A	2									8		26		10
30448	B	812	0	DEMPSEY	BARRETT	5	5/30/96	8:16	3448B	1									24		48		11
30443	B	812	0	ANDON	DONOHOE	4	5/29/96	8:17	3472B	1									33		52		12
30462	B	812	0	DEMPSEY	DONOHOE	6	5/10/96	8:35	3678A	1									22		65		13
30447	B	812	0	BARRETT	ANDON	4	5/22/96	8:47	3660B	1									12		17		14

Sum	262
Mean	18.7
STDEV	13.4
COV	0.72
Tolenrance	42.1 %

Table B-2.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - B Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30453	B	812	0	ANDON	DEMPSEY	5	5/16/96	9:38	3695A	2									10		10	1
30463	B	812	0	BARRETT	DOOLAN	6	5/10/96	9:48	3412A	1									26		45	2
30442	B	812	0	DEMPSEY	ANDON	4	4/24/96	9:52	3644B	1									1		10	3
30435	B	812	0	DONOHOE	DOOLAN	4	5/15/96	10:04	3501	2									8		17	4
30434	B	812	0	DEMPSEY	ANDON	4	5/15/96	10:07	3499B	1									2		3	5
30451	B	812	0	DONOHOE	DEMPSEY	5	5/9/96	10:08	3621A	1									34		32	6
30436	B	812	0	BARRETT	SASSO	4	5/15/96	10:09	3620B	1									42		6	7
30460	B	812	0	DEMPSEY	DONOHOE	6	4/19/96	10:31	3543A	1									17		21	8
30458	B	812	0	SASSO	ANDON	6	4/19/96	10:54	3651B	1									61		51	9
30445	B	812	0	DEMPSEY	BARRETT	4	5/29/96	10:56	3543B	1									27		38	10
30465	B	812	0	SASSO	ANDON	6	5/10/96	11:20	3653B	1									54		40	11
30446	B	812	0	BARRETT	ANDON	4	5/22/96	11:24	3470A	1									24		16	12
30449	B	812	0	DEMPSEY	BARRETT	5	5/30/96	11:33	3421B	1									25		28	13
30408	B	812	0	DEMPSEY	ANDON	2	5/20/96	12:45	3633A	1									13		17	14
30422	B	812	0	BARRETT	SASSO	3	4/23/96	13:05	3605B	1									36		17	15
30427	B	812	0	DONOHOE	DOOLAN	3	5/21/96	13:05	3683A	2									18		14	16
30405	B	812	0	BARRETT	SASSO	2	5/20/96	13:07	3641A	1									31		40	17
30426	B	812	0	DONOHOE	DEMPSEY	3	5/14/96	13:07	3660A	1									23		7	18
30433	B	812	0	ANDON	DEMPSEY	3	5/21/96	13:11	3437B	1									36		59	19
30410	B	812	0	BARRETT	SASSO	2	5/13/96	13:15	3601A	1									44		42	20
30450	B	812	0	BARRETT	DONOHOE	5	4/25/96	13:20	3624B	2									29		27	21
30421	B	812	0	ANDON	DEMPSEY	3	4/23/96	13:33	3651B	1									68		51	22
30429	B	812	0	BARRETT	SASSO	3	5/21/96	13:36	3517B	2									39		57	23
30409	B	812	0	DOOLAN	DONOHOE	2	5/13/96	13:53	3653B	2									29		62	24
30440	B	812	0	DEMPSEY	ANDON	4	5/8/96	13:53	3606A	1									73		60	25
30406	B	812	0	DONOHOE	DOOLAN	2	5/20/96	13:59	3470A	1									41		23	26

Sum	811
Mean	31.2
STDEV	18.6
COV	0.60
Tolenrance	25.8 %

Table B-2.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - B Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30455	B	812	0	BARRETT	SASSO	5	5/9/96	14:09	3629A	2									45		43		1
30439	B	812	0	DONOHOE	DOOLAN	4	5/8/96	14:30	3676A	2									31		20		2
30412	B	812	0	ANDON	DEMPSEY	2	5/13/96	14:42	3600B	1									43		61		3
30430	B	812	0	BARRETT	SASSO	3	5/14/96	14:47	3412A	2									29		51		4
30431	B	812	0	ANDON	DEMPSEY	3	5/21/96	15:46	3489B	2									20		44		5
30418	B	812	0	DONOHOE		3	5/28/96	15:54	3660B	2									10		10		6
																		Sum	178				
																		Mean	29.7				
																		STDEV	13.4				
																		COV	0.45				
																		Tolenrance	40.5 %				
30420	B	812	0	DEMPSEY	ANDON	3	5/28/96	16:23	3526B	1									60		67		1
30407	B	812	0	ANDON	DEMPSEY	2	5/20/96	17:02	3600B	1									74		69		2
30419	B	812	0	BARRETT	DOOLAN	3	5/28/96	17:50	3659A	1									56		80		3
30428	B	812	0	BARRETT	SASSO	3	5/21/96	18:15	3493	2									36		67		4
30437	B	812	0	DEMPSEY	ANDON	4	5/8/96	18:20	3691B	1									76		79		5
30438	B	812	0	BARRETT	SASSO	4	5/8/96	18:42	3653B	1									67		70		6
																		Sum	369				
																		Mean	61.5				
																		STDEV	14.7				
																		COV	0.24				
																		Tolenrance	21.5 %				
30411	B	812	0	BARRETT	SASSO	2	5/13/96	19:05	3468A	1									41		38		1
30432	B	812	0	BARRETT	SASSO	3	5/14/96	19:32	3617B	1									42		62		2
30413	B	812	0	DEMPSEY	DONOHOE	2	5/6/96	19:33	3488B	1									72		38		3
30416	B	812	0	BARRETT	ANDON	2	4/22/96	19:55	3663A	2									53		65		4
30415	B	812	0	BARRETT	ANDON	2	5/6/96	20:05	3631A	1									74		60		5
30425	B	812	0	DEMPSEY	ANDON	3	5/7/96	20:27	3606A	2									16		42		6
30423	B	812	0	DOOLAN	DONOHOE	3	5/7/96	21:42	3501A	2									11		73		7
30414	B	812	0	SASSO	DOOLAN	2	5/6/96	21:57	3637A	2									33		46		8
30417	B	812	0	DEMPSEY	DONOHOE	2	4/22/96	22:55	3603B	1									48		71		9
30424	B	812	0	BARRETT	SASSO	3	5/7/96	22:55	3637A	1									37		52		10
																		Sum	427				
																		Mean	42.7				
																		STDEV	20.6				
																		COV	0.48				
																		Tolenrance	33.6 %				

Table B-2.4
Trip Sample Records: Weekend Surface Green Line - B Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30392	B	812	0	BARRETT	ANDON	1	4/21/96	18:47	3489B	1									32			45	1
30394	B	812	0	BARRETT	ANDON	1	4/21/96	21:50	3661B	1									56			142	2
30395	B	812	0	DONOHOE	DEMPSEY	1	4/21/96	13:33	3698A	1									62			57	3
30396	B	812	0	DEMPSEY	DONOHOE	1	4/21/96	16:42	3695A	1									72			97	4
30397	B	812	0	DONOHOE	DEMPSEY	1	4/21/96	14:56	3683A	1									3			42	5
30398	B	812	0	DONOHOE	SASSO	1	4/28/96	15:24	3696A	1									54			56	6
30399	B	812	0	SASSO	DONOHOE	1	4/28/96	13:17	3622B	1									2			8	7
30400	B	812	0	ANDON	DEMPSEY	1	4/28/96	16:10	3630B	1									8			37	8
30401	B	812	0	ANDON	DEMPSEY	1	4/28/96	13:31	3673B	1									68			31	9
30402	B	812	0	BARRETT	DOOLAN	1	4/28/96	18:51	3658	1									41			52	10
30403	B	812	0	DOOLAN	DONOHOE	1	5/12/96	13:47	3688	1									11			38	11
30404	B	812	0	ANDON	DEMPSEY	1	5/19/96	14:18	3649B	1									7			42	12
30470	B	812	0	SASSO	ANDON	7	4/20/96	22:58	3698A	1									102			71	13
30471	B	812	0	DEMPSEY	DONOHOE	7	4/20/96	8:25	3663	1									3			8	14
30472	B	812	0	DEMPSEY	DOOLAN	7	5/11/96	7:30	3646B	1									4			10	15
30473	B	812	0	ANDON	DONOHOE	7	5/11/96	6:33	3631A	1									6			17	16
30474	B	812	0	SASSO	BARRETT	7	5/11/96	10:40	3601A	1									43			33	17
30475	B	812	0	BARRETT	SASSO	7	5/18/96	21:14	3661A	1									39			75	18
30476	B	812	0	DONOHOE	DOOLAN	7	5/18/96	12:13	3413A	1									119			111	19
30477	B	812	0	DONOHOE	DOOLAN	7	5/18/96	11:00	3695A	1									37			90	20
30478	B	812	0	SASSO	ANDON	7	4/20/96	17:30	3683A	2									46			78	21

Sum	815
Mean	38.8
STDEV	33.5
COV	0.86
Tolenrance	41.5 %

Table B-3.1
Trip Sample Records: Weekday Surface Green Line - C Inbound

Rec No	Probl.	Rte	No	Dir.	Obs	Rec.	Day	Date	Time	Veh No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor.	Calc. of Fare Evation		Av. FB	n
30148		C	831	1	DEMPSEY	DONOHOE	4	5/22/96	5:01	3650A	1	2996880	2997075	0	2	7	3	0				17	17	17	1.95	2.3	YES	2.30	27.60	1.95	2.3	0.192	1
30181		C	831	1	DOOLAN	BARRETT	6	5/10/96	5:30	3649A	1	2594148	2594423	0	3	13	1	0				16	17	17	2.75	2.75	YES	2.75	46.75	2.75	2.75	0.162	2
														Sum	5	20	4	0	0	0	0	Mean	14.5				2.53	0.174			0.177	2
														%	0.172	0.690	0.138	0.000	0.000	0.000	0.000	STDEV	3.5				0.318	1.125			0.021	2
														29								COV	0.24				0.13	0.21			0.12	2
																						Tolerance	36.2				18.7	1.00			17.8	2
30001	1	C	831	1	ANDON	DOOLAN	5	5/9/96	8:05	3542B	1	2014204	2016644	0	30	110	5	0			10	150	155	24.4	26.5	YES	26.50	4107.50	24.4	26.5	0.171	1
30183		C	831	1	DEMPSEY	DONOHOE	6	4/19/96	6:01	3655A	1	1090104	1090569	0	9	20	0	0				27	29	29	4.65	7.65	YES	7.65	221.85	4.65	7.65	0.264	2
30197		C	831	1	DEMPSEY	DONOHOE	6	5/10/96	6:01	3684B	1	3044481	3044841	1	9	10	1	0			2		22	22	4.6	7.85	YES	7.85	172.70	4.6	7.85	0.357	3
30170		C	831	1	DEMPSEY	BARRETT	5	5/30/96	6:30	3680A	2	2718057	2718252	0	2	14	0	0				15	16	16	1.95	1.7	NO	1.70	27.20			0.106	4
30196		C	831	1	DOOLAN	BARRETT	5	5/16/96	6:30	3688B	1	3861618	3861948	0	11	24	3	0			1	32	39	39	3.3	9.95	NO	9.95	388.05			0.255	5
30149		C	831	1	DONOHOE	DEMPSEY	4	5/22/96	6:37	3614B	1	1368829	1369189	0	7	23	1	0	3			25	34	34	3.6	6.15	YES	6.15	209.10	3.6	6.15	0.181	6
30161		C	831	1	SASSO	DONOHOE	4	4/24/96	6:37	3473A	1	1.9E+07	1.9E+07	0	6	31	2	0				35	39	39	5.21	5.5	YES	5.50	214.50	5.21	5.5	0.141	7
30173		C	831	1	DEMPSEY	DONOHOE	6	5/10/96	6:46	3696A	2	967606	967986	0	5	20	1	0			1	26	27	27	3.8	4.45	YES	4.45	120.15	3.8	4.45	0.165	8
30178		C	831	1	ANDON	SASSO	6	5/10/96	6:50	3649B	1	3988220	3988965	0	11	30	4	0				41	45	45	7.45	10.15	YES	10.15	456.75	7.45	10.15	0.226	9
30175		C	831	1	DEMPSEY	DONOHOE	6	4/19/96	6:57	3693A	1	2419139	2419649	0	9	27	0	2			1	35	39	39	5.1	8.45	YES	8.45	329.55	5.1	8.45	0.217	10
30576		C	831	1	DEMPSEY	DONOHOE	5	5/9/96	7:21	3646D	2	2168802	2169052	0	14	56	1	1			1	63	73	73	2.5	12.5	NO	12.50	912.50			0.171	11
30162		C	831	1	DONOHOE	ANDON	5	5/30/96	7:22	3432B	2	21780	23705	0	32	85	1	0			1	115	119	119	19.25	27.4	YES	27.40	3260.60	19.25	27.4	0.230	12
30160		C	831	1	DONOHOE	ANDON	4	5/29/96	7:42	3681B	2	3104836	3106806	0	32	103	2	1			2	138	140	140	19.7	28	YES	28.00	3920.00	19.7	28	0.200	13
30157		C	831	1	DEMPSEY	ANDON	4	4/24/96	7:55	3608A	1	1673865	1675589	0	30	100	6	0			1	125	137	137	17.24	26.7	YES	26.70	3657.90	17.24	26.7	0.195	14
30156		C	831	1	BARRETT	DOOLAN	4	4/24/96	8:08	3692A	2	3904491	3906466	0	34	107	1	0				150	142	142	19.75	29.1	YES	29.10	4132.20	19.75	29.1	0.205	15
30176		C	831	1	SASSO	ANDON	6	4/19/96	8:45	3655B	2	109569	111064	0	18	40	5	0	1			56	64	64	14.95	16.3	YES	16.30	1043.20	14.95	16.3	0.255	16
														Sum	259	800	33	4	4	20	0	Mean	70.0				14.27	0.204			0.269	16
														%	0.231	0.714	0.029	0.004	0.004	0.018	0.000	STDEV	50.2				9.812	479.283			0.058	16
														1120								COV	0.72				0.69	0.18			0.28	16
																						Tolerance	37.6				36.1	0.97			14.7	16
30002	1	C	831	1	DONOHOE	DOOLAN	2	5/20/96	12:12	3678	1	3787301	3788106	0	13	9	4	0			40	81				YES						1
30168		C	831	1	DEMPSEY	ANDON	5	5/16/96	9:12	3631B	2	2111399	2112184	0	10	12	0	0				15	22	22	7.85	8.5	YES	8.50	187.00	7.85	8.5	0.386	1
30166		C	831	1	DONOHOE	DEMPSEY	5	5/9/96	9:34	3542B	1	2016644	2021019	0	59	66	14	0			1	113	140	140	43.75	52.95	YES	52.95	7413.00	43.75	52.95	0.378	2
30174		C	831	1	DEMPSEY	DONOHOE	6	4/19/96	9:54	3640B	1	2605172	2612992	0	33	32	9	2				79	76	76	78.2	30.65	NO	30.65	2329.40			0.408	3
30562		C	831	1	DEMPSEY	BARRETT	4	5/29/96	10:24	3630A	1	2078281	2088356	0	31	26	7	0				57	64	100.75	27.75	NO	27.75	1776.00			0.434	4
30171		C	831	1	DEMPSEY	BARRETT	5	5/30/96	10:24	3641A	1	2494194	2496228	0	28	20	9	5	1			55	63	20.34	27.6	YES	27.60	1738.80	20.34	27.6	0.438	5
30132		C	831	1	BARRETT	ANDON	4	5/22/96	10:30	3650A	1	2997435	3000656	0	49	40	27	0				116	116	32.21	47.05	YES	47.05	5457.80	32.21	47.05	0.406	6
30182		C	831	1	DEMPSEY	BARRETT	6	5/31/96	10:30	3652A	1	2566735	2568045	0	19	15	5	0			1	32	40	13.1	17.15	YES	17.15	686.00	13.1	17.15	0.429	7
30158		C	831	1	DONOHOE	SASSO	4	4/24/96	10:31	3691B	1	3230777	3232692	0	33	33	6	0			1	74	73	73	19.15	29.25	YES	29.25	2135.25	19.15	29.25	0.401	8
30172		C	831	1	BARRETT	DOOLAN	6	4/19/96	10:31	3645A	1	1937663	1939708	0	28	28	10	0				48	66	20.45	25.8	YES	25.80	1702.80	20.45	25.8	0.391	9
30177		C	831	1	SASSO	ANDON	6	5/10/96	10:54	3691A	2	1072634	1072799	0	2	3	1	0				6	6	1.65	1.9	YES	1.90	11.40	1.65	1.9	0.317	10
30163		C	831	1	ANDON	DONOHOE	5	5/30/96	11:00	3646A	1	2373917	2374802	0	15	10	5	0			3	29	33	33	8.85	13.75	YES	13.75	453.75	8.85	13.75	0.417	11
30167		C	831	1	ANDON	DOOLAN	5	5/9/96	11:00	3491B	1	1712254	1715573	0	41	24	17	4	3	3		57	92	33.19	39.65	YES	39.85	3666.20	33.19	39.85	0.433	12
30179		C	831	1	BARRETT	DOOLAN	6	5/10/96	11:15	3680A	2	2548683	2548788	0	2	3	1	0				5	6	1.05	1.9	YES	1.90	11.40	1.05	1.9	0.317	13
30169		C	831	1	BARRETT	SASSO	5	5/16/96	11:31	3601A	1	1570981	1572980	0	27	19	10	0	2			48	58	19.99	24.95	YES	24.95	1447.10	19.99	24.95	0.430	14
30155		C	831	1	BARRETT	DOOLAN	4	4/24/96	11:42	3637B	1	2357770	2360101	1	23	27	12	0			1	45	63	24.31	21.95	NO	21.95	1382.85			0.348	15
30180		C	831	1	BARRETT	DOOLAN	6	5/10/96	12:00	3696A	2	968356	968939	0	9	10	0	0				13	19	5.83	7.65	YES	7.65	145.35	5.83	7.65	0.403	16
30130		C	831	1	DONOHOE	DOOLAN	3	5/21/96	12:12	3614A	1	2685664	2689025	0	41	20	11	3				67	75	33.61	38.25	YES	38.25	2868.75	33.61	38.25	0.510	17
30132		C	831	1	DEMPSEY	ANDON	3	5/21/96	12:30	3622A	1	693023	694978	0	25	31	12	0				59	68	19.55	23.65	YES	23.65	1608.20	19.55	23.65	0.348	18
30109		C	831	1	DEMPSEY	ANDON	2	5/13/96	12:36	3684A	1	3472692	3474057	0	19	17	9	0			1	31	46	13.65	17.95	YES	17.95	825.70	13.65	17.95	0.390	19
30164		C	831	1	ANDON	DOOLAN	5	5/9/96	12:36	3622A	1	658823	661274	0	34	32	21	0			1	32	68	24.51	33.1	YES	33.10	2912.80	24.51	33.1	0.376	20
30134		C	831	1	DOOLAN	BARRETT	3	5/28/96	13:12	3631A	1	2749875	2751739	0	24	18	7	0				34	49	18.64	21.8	YES	21.80	1068.20	18.64	21.8	0.445	21
30147		C	831	1	BARRETT	SASSO	4	5/15/96	13:15	3600B	1	2431478	2433398	1	29	32	19	0			1	60	81	20.2	28.45	YES	28.45	2304.45	20.2	28.45	0.351	22
30104		C	831	1	DONOHOE	DOOLAN	2	5/13/96	13:30	3634B	1	2370819	2372240	0	22	20	8	0				49	50	14.21	20.3	YES	20.30	1015.00	14.21	20.3	0.406	23
30145		C	831	1	DONOHOE	DOOLAN	4	5/15/96	13:48	3637B	1	2414100	2416664	0	37	27	16	0			2	55	82	25.64	34.65	YES	34.65	2841.30	25.64	34.65	0.423	24
30510		C	831	1	BARRETT	SASSO	2	5/20/96	13:50	3667A	2	3126832	3126832	0	35	22	3	0	27	1		85	88	0	30.35	NO	30.35	2670.80			0.345	25
30143		C	831	1	ANDON	DEMPSEY	4	5/15/96	13:53	3622A	1	666577	668932	0	3	10	5	0			1	16	19	23.55	3.35	NO	3.55	67.45			0.187	26
														Sum	678	597	244	14	33	16	1	Mean	60.9				24.26	0.398			0.389	26
														%	0.428	0.377	0.154	0.009	0.021	0.010	0.001	STDEV	32.3				13.108	413.073			0.060	26
														1583								COV	0.53				0.54	0.11			0.15	26
																						Tolerance	21.8				22.3	0.98			6.3	26

Table B-3.1 (cont.)
Trip Sample Records: Weekday Surface Green Line - C Inbound

Rec No	Probl	Rte	No.	Dir	Obs	Rec	Day	Date	Time	Veh No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St.1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor.	Calc. of Fare Evation		Av FB	n
30150		C	831	1	SASSO	DOOLAN	4	5/22/96	14:00	3618A	1	3067495	3069701	1	29	26	13	6	5			66	79	23.06	29.65	YES	29.65	2342.35	23.06	29.65	0.375	1
30159		C	831	1	DONOHOE	DOOLAN	4	5/8/96	14:00	3692B	1	2543046	2544577	0	30	25	5	2			4	68	66	15.31	27.3	YES	27.30	1801.80	15.31	27.3	0.414	2
30133		C	831	1	SASSO	DONOHOE	3	5/28/96	14:37	3442B	1	1710117	1710946	0	16	18	4	3	2			30	43	8.29	15.6	YES	15.60	670.80	8.29	15.6	0.363	3
30111		C	831	1	ANDON	DEMPSEY	2	5/20/96	15:04	3678A	2	3788106	3788551	0	5	6	0	1	1			5	13	4.45	4.65	YES	4.65	60.45	4.45	4.65	0.358	4
30138		C	831	1	DEMPSEY	ANDON	3	5/21/96	15:16	3622A	2	694978	695508	0	8	11	4	0				18	23	5.3	7.6	YES	7.60	174.80	5.3	7.6	0.330	5
30507		C	831	1	BARRETT	SASSO	2	5/20/96	15:20	3542A	1	1770276	1772394	0	36	25	7	1	3			55	72	21.18	32.4	YES	32.40	2332.80	21.18	32.4	0.450	6
30125		C	831	1	BARRETT	SASSO	3	4/23/96	15:23	3624B	2	2593401	2593826	0	8		1	1		3		11	13	4.25	7.4	YES	7.40	96.20	4.25	7.4	0.569	7
30146		C	831	1	BARRETT	SASSO	4	5/15/96	15:29	3658A	2	3055137	3055772	0	8	4	0	0				10	12	6.35	6.8	YES	6.80	81.60	6.35	6.8	0.567	8
30107		C	831	1	BARRETT	SASSO	2	5/13/96	15:30	3620A	2	1113979	1114749	0	10	4	1	0				7	15	7.7	8.7	YES	8.70	130.50	7.7	8.7	0.580	9
30124		C	831	1	DEMPSEY	ANDON	3	4/23/96	15:44	3626A	2	1106756	1107291	0	8	7	4	1				12	20	5.35	8	YES	8.00	160.00	5.35	8	0.400	10
														Sum	158	126	39	15	11	7	0	Mean	35.6				14.81	0.416			0.441	10
														%	0.444	0.354	0.110	0.042	0.031	0.020	0.000	STDEV	27.1				10.772	286.549			0.096	10
														356								COV	0.76				0.73	0.25			0.22	10
																						Tolerance	50.5				48.3	0.98			14.5	10
30533		C	831	1	ANDON	DEMPSEY	3	5/28/96	16:03	3442A	2	1334731	1335571	0	9	9	0	0				17	18	8.4	7.65	NO	7.65	137.70			0.425	1
30144		C	831	1	ANDON	DEMPSEY	4	5/15/96	16:06	3675A	2	2155570	2156035	0	5	9	6	0			1	19	21	4.65	5.45	YES	5.45	114.45	4.65	5.45	0.260	2
30131		C	831	1	DONOHOE	DOOLAN	3	5/21/96	16:08	3609A	2	1838788	1839158	0	6	7	1	0			2	14	16	3.7	5.3	YES	5.30	84.80	3.7	5.3	0.331	3
30112		C	831	1	DONOHOE	DOOLAN	2	5/20/96	16:27	3630B	1	175086	176221	0	15	8	2	0			2	20	27	11.35	13.15	YES	13.15	355.05	11.35	13.15	0.487	4
30142		C	831	1	DONOHOE	DOOLAN	4	5/15/96	16:27	3637D	1	2416664	2418309	2	26	20	0	0				60	46	18.45	22.1	YES	22.10	1016.60	18.45	22.1	0.480	5
30106		C	831	1	DARRETT	SASSO	2	5/13/96	16:32	3542B	2	2044129	2044824	0	9	6	1	0			1	13	17	6.95	7.85	YES	7.85	133.45	6.95	7.85	0.462	6
30165		C	831	1	DONOHOE	BARRETT	5	4/25/96	16:40	3669A	1	1794915	1795785	0	15	11	1	0	1			23	28	8.7	12.95	YES	12.95	362.60	8.7	12.95	0.463	7
30105		C	831	1	DONOHOE	DOOLAN	2	5/13/96	16:47	3683A	2	2706692	2707037	0	5	15	1	0			1	16	22	3.45	4.45	YES	4.45	97.90	3.45	4.45	0.202	8
30151		C	831	1	SASSO	DOOLAN	4	5/22/96	16:47	3684A	2	3561972	3562897	0	14	12	2	0				20	28	9.25	12.3	YES	12.30	344.40	9.25	12.3	0.439	9
30136		C	831	1	BARRETT	SASSO	3	5/21/96	16:48	3619A	1	2243960	2245291	0	24	14	4	0	1			39	43	13.31	21.2	YES	21.20	911.60	13.31	21.2	0.490	10
30534		C	831	1	BARRETT	SASSO	3	5/14/96	17:30	3622B	1	1915526	1915526	0	18	8	1	0				25	27	0	15.5	NO	15.50	418.50			0.574	11
30135		C	831	1	BARRETT	SASSO	3	5/21/96	17:33	3601A	2	1597727	1597727	0	0	3	0	0				0	3	0	0	YES	0.00	0.00	0	0	0.000	12
30194		C	831	1	DONOHOE	DOOLAN	4	5/8/96	17:40	3488A	1	1828798	1829893	0	16	19	6	0			1	34	42	10.95	14.8	YES	14.80	621.60	10.95	14.8	0.352	13
30110		C	831	1	ANDON	DEMPSEY	2	5/13/96	17:59	3677D	1	3965014	3965995	0	12	17	2	0				24	31	9.81	10.6	YES	10.60	328.60	9.81	10.6	0.342	14
30122		C	831	1	ANDON	BARRETT	2	4/21/96	18:00	3680A	2	2430593	2430818	0	6	8	0	0				10	14	2.25	5.1	NO	5.10	71.40			0.364	15
														Sum	180	166	27	0	2	8	0	Mean	25.9				10.56	0.414			0.378	15
														%	0.470	0.433	0.070	0.000	0.005	0.021	0.000	STDEV	11.8				6.282	68.155			0.143	15
														383								COV	0.46				0.59	0.15			0.38	15
																						Tolerance	25.0				32.3	0.92			20.5	15
30195		C	831	1	BARRETT	SASSO	5	5/9/96	18:22	3623B	2	97086	97121	0	3	7	0	0				5	10	0.35	2.55	NO	2.55	25.50			0.255	1
30141		C	831	1	BARRETT	SASSO	3	5/14/96	18:24	3603D	2	1625924	1626179	0	4	6	0	0				7	10	2.55	3.4	YES	3.40	34.00	2.55	3.4	0.340	2
30137		C	831	1	ANDON	DEMPSEY	3	5/21/96	18:25	3618A	2	3064121	3064823	0	9	14	1	0			1	21	25	7	7.85	YES	7.85	196.25	7	7.85	0.314	3
30511		C	831	1	DONOHOE	DEMPSEY	2	4/22/96	18:30	3640A	1	2413450	2418680	1	16	20	2	0			1	23	39	53.3	14	NO	14.00	546.00			0.359	4
30113		C	831	1	BARRETT	SASSO	2	5/20/96	18:31	3651A	2	2270879	2270964	0	1	2	0	0				0	3	0.85	0.85	YES	0.85	2.55	0.85	0.85	0.283	5
30123		C	831	1	BARRETT	SASSO	3	4/23/96	18:31	3626A	2	1107291	1107411	0	1	13	1	0				9	15	1.2	1.05	NO	1.05	15.75			0.070	6
30140		C	831	1	DONOHOE	DEMPSEY	3	5/14/96	18:31	3637B	1	2408802	2410187	0	23	24	3	0			1	39	51	13.85	20.15	YES	20.15	1027.65	13.85	20.15	0.395	7
30108		C	831	1	BARRETT	SASSO	2	5/13/96	18:37	3684B	1	3051443	3052673	0	18	33	1	0			2	54	33	12.3	15.5	YES	15.30	837.00	12.3	15.5	0.287	8
30139		C	831	1	ANDON	DEMPSEY	3	4/23/96	18:44	3634A	1	2327637	2330042	2	31	44	3	1			2	81	51	26.05	27.35	YES	27.35	2215.35	26.05	27.35	0.338	9
30120		C	831	1	DONOHOE	DEMPSEY	2	4/22/96	19:30	3680B	1	1608738	1609536	1	9	13	3	0				25	16	8.98	8.25	NO	8.25	206.25			0.330	10
30129		C	831	1	BARRETT	SASSO	3	5/7/96	20:42	3679B	1	224117	225597	0	21	23	1	0			2	47	45	14.8	18.05	YES	18.05	848.35	14.8	18.05	0.384	11
30154		C	831	1	BARRETT	SASSO	4	5/8/96	20:50	3600A	1	2522466	2524516	0	30	19	2	0			2	53	50	20.5	25.9	YES	25.90	1372.70	20.5	25.9	0.489	12
30126		C	831	1	DONOHOE	DOOLAN	3	5/7/96	21:10	3619B	1	2322126	2323001	0	15	13	1	0				29	19	8.75	12.95	YES	12.95	375.55	8.75	12.95	0.447	13
30114		C	831	1	SASSO	DOOLAN	2	5/6/96	21:20	3647B	1	2153701	2154276	2	12	8	2	0			1	18	23	7.75	10.6	YES	10.60	243.80	7.75	10.6	0.461	14
30117		C	831	1	BARRETT	ANDON	2	5/6/96	22:00	3698B	1	1242775	1243380	0	11	23	1	1			1	26	37	6.05	9.95	YES	9.95	368.15	6.05	9.95	0.269	15
30121		C	831	1	BARRETT	ANDON	2	4/22/96	22:10	3644A	1	2170158	2170979	1	14	19	0	2				26	35	9.21	12.7	YES	12.70	444.50	9.21	12.7	0.363	16
30118		C	831	1	DEMPSEY	DONOHOE	2	4/22/96	22:20	3670B	1	1367857	1368412	0	10	7	2	0			4	20	23	5.55	8.9	YES	8.90	204.70	5.55	8.9	0.387	17
30127		C	831	1	DEMPSEY	ANDON	3	5/7/96	22:30	3653B	1	2791513	2792408	0	13	17	1	0				31	24	8.9	11.25	YES	11.25	348.75	8.9	11.25	0.363	18
30512		C	831	1	DEMPSEY	DONOHOE	2	5/6/96	22:34	3643A	1	2937577	2937577	1	9	14	0	0			4	19	27	1	7.65	NO	7.65	206.55			0.283	19
30128		C	831	1	BARRETT	SASSO	3	5/7/96	22:41	3681B	1	2884911	2885176	0	5	7	0	0				7	12	2.65	4.25	YES	4.25	51.00	2.65	4.25	0.354	20
30116		C	831	1	BARRETT	ANDON	2	5/6/96	22:50	3612A	1	2791442	2792147	0	11	13	0	0				17	24	7.05	9.35	YES	9.35	224.40	7.05	9.35	0.390	21
30119		C	831	1	SASSO	DOOLAN	2	4/22/96	23:10	3634B	1	2277785	2278312	2	12	8	0	0				20	19	7.27	10.2	YES	10.20	204.00	7.27	10.2	0.510	22
30115		C	831	1	SASSO	DOOLAN	2	5/6/96	23:30	3644B	1	2789189	2789244	0	2	3	0	0				3	5	0.55	1.7	NO	1.70	8.50			0.340	23
														Sum	280	350	24	4	0	21	0	Mean	29.5				10.63	0.360	12.20	16.18	0.348	23
														%	0.412	0.515	0.035	0.006	0.000	0.031	0.000	STDEV	18.6				7.250	126.915	24.6 %		0.091	23
														679								COV	0.63				0.68	0.14			0.26	23
																						Tolerance	27.5				29.9	0.94			11.4	23

Table B-3.2
Trip Sample Records: Weekend Surface Green Line - C Inbound

Rec No.	Probl.	Rte	No	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg	End	Blks	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor.	Calc. of Fare Evation		Av. FB	n
30103		C	831	1	DOOLAN	DONOHOE	1	5/12/96	12 12	3641B	1	498301	500151	4	36	30	1	0		10		66	77	22.5	30.8	YES	30.80	2371 60	22.5	30.8	0 400	1
30102		C	831	1	ANDON	DEMPSEY	1	4/28/96	12:31	3697A	1	3800775	3802285	0	15	20	5	1		3		40	44	15.1	14.15	NO	14.15	622.60			0.322	2
30092		C	831	1	DONOHOE	DOOLAN	1	5/19/96	15:07	3619B	1	2491214	2493039	0	28	25	11	0		7		61	71	18.25	26	YES	26.00	1846.00	18.25	26	0.366	3
30097		C	831	1	BARRETT	DOOLAN	1	4/28/96	15:07	3697A	1	3802285	3803645	0	20	24	1	0		12		48	57	13.6	17.2	YES	17.20	980.40	13 6	17.2	0.302	4
30480		C	831	1	DOOLAN	DONOHOE	1	5/12/96	16:59	3692A	1	3977052	3977052	0	8	14	2	1				23	25	0	7.6	NO	7.60	190 00			0.304	5
30098		C	831	1	DONOHOE	SASSO	1	4/28/96	17:38	3612B	1	2146855	2148380	0	17	25	5	0		5		38	52	15.25	15 45	YES	15.45	803.40	15.25	15.45	0.297	6
30096		C	831	1	BARRETT	DOOLAN	1	4/28/96	18:09	3620B	1	3218650	3219729	0	12	21	1	1		5		28	40	10.79	10.8	YES	10.80	432 00	10.79	10.8	0.270	7
30091		C	831	1	DONOHOE	DOOLAN	1	5/19/96	18:22	3639A	1	1412637	1413809	0	17	8	0	0		1		18	26	11.72	14 45	YES	14.45	375.70	11 72	14.45	0.556	8
30090		C	831	1	ANDON	DEMPSEY	1	5/19/96	18:29	3494A	1	1385977	1387157	0	20	14	3	0		7		31	44	11 8	17.6	YES	17.60	774.40	11.8	17.6	0 400	9
30099		C	831	1	DONOHOE	SASSO	1	4/28/96	18:30	3655B	1	182043	182723	2	8	7	0	0		4		17	19	8.8	6.8	NO	6.80	129.20			0.358	10
30093		C	831	1	BARRETT	SASSO	1	5/19/96	19:10	3623B	1	166183	167503	0	20	21	0	0		8		35	49	13 2	17	YES	17.00	833.00	13.2	17	0.347	11
30094		C	831	1	BARRETT	SASSO	1	5/19/96	21:31	3623B	1	167503	168703	3	17	2	5	0		10		40	34	15	15.45	YES	15.45	525.30	15	15.45	0.454	12
30100		C	831	1	BARRETT	ANDON	1	4/21/96	21:36	3644B	1	2546675	2547424	0	12	9	1	0				16	22	7.49	10.4	YES	10.40	228.80	7.49	10.4	0.473	13
30153		C	831	1	BARRETT	SASSO	1	5/8/96	22.40	3634A	1	2428121	2428931	0	13	10	0	2				20	25	8.1	11.85	YES	11.85	296.25	8.1	11.85	0.474	14
30101		C	831	1	BARRETT	ANDON	1	4/21/96	23.16	3644B	1	2547534	2548034	0	6	6	0	0		2		14	14	5	5 1	YES	5.10	71.40	5	5.1	0.364	15
30095		C	831	1	BARRETT	SASSO	1	5/19/96	23:20	3609B	1	2693774	2694029	1	3	8	0	0		4		11	15	3.55	2.55	NO	2.55	38.25			0 170	16
30193		C	831	1	DEMPSEY	DOOLAN	7	5/11/96	6:00	3687B	1	2826625	2826965	0	4	4	0	0				6	8	3.4	3.4	YES	3.40	27.20	3.4	3.4	0.425	17
30187		C	831	1	ANDON	DEMPSEY	7	5/18/96	9:00		1	2894952	2897272	0	40	37	7	0				72	84	23.2	35.4	YES	35.40	2973.60	23.2	35.4	0.421	18
30198		C	831	1	BARRETT	SASSO	7	5/11/96	9:08	3610B	1	3335068	3335467	0	8	14	4	0				22	26	3.99	7.6	YES	7.60	197 60	3.99	7.6	0.292	19
30189		C	831	1	DONOHOE	DOOLAN	7	5/18/96	9:45	3656B	1	2493351	2495646	0	33	25	11	0				66	69	20.95	30.25	YES	30.25	2087.25	20.95	30.25	0.458	20
30191		C	831	1	DONOHOE	ANDON	7	5/11/96	10:20	3606B	1	1973262	1974407	0	16	13	2	0		2		26	33	11.45	14	YES	14.00	462.00	11.45	14	0.424	21
30604		C	831	1	DEMPSEY	DONOHOE	7	4/20/96	10:20	3655A	1	1673409	1673409	0	22	21	5	0				45	48	0	19.7	NO	19.70	945.60			0.410	22
30188		C	831	1	DEMPSEY	DOOLAN	7	5/11/96	10:22	3634B	1	2361514	2363734	1	31	24	4	1				40	60	23.2	27.55	YES	27.55	1653.00	23.2	27.55	0.459	23
30192		C	831	1	DONOHOE	ANDON	7	5/11/96	11:05	3637A	1	3926411	3928641	0	33	39	11	1		1		75	85	22.3	30.65	YES	30.65	2605.25	22.3	30.65	0.361	24
30186		C	831	1	DEMPSEY	ANDON	7	5/18/96	12:15	3664B	1	1375631	1378166	1	34	18	4	0		1		47	57	26.35	29.7	YES	29.70	1692.90	26.35	29.7	0.521	25
30185		C	831	1	BARRETT	SASSO	7	5/18/96	18:38	3614B	1	1347600	1349065	0	28	30	3	0				50	61	14.65	24.4	YES	24.40	1488.40	14 65	24.4	0 400	26
30190		C	831	1	SASSO	ANDON	7	4/20/96	20:43	3608A	1	1642823	1643779	0	12	8	0	0				20	20	9.56	10.2	YES	10 20	204.00	9.56	10.2	0.510	27
30184		C	831	1	BARRETT	SASSO	7	5/18/96	22:30	3623B	1	161441	162691	3	14	9	1	1		11		28	36	15.5	12.5	NO	12 50	430.00			0.347	28
														Sum	527	486	87	8	0	93	0	Mean	42.9			0.390	16.73	0.390	14.17	18.42	0.388	
														%	0.439	0.405	0.072	0.007	0.000	0.077	0.000	STDEV	22.0				9.279	192.876	23.1 %		0.085	
														1201								COV	0.51				0.555	0.106			0.22	
																						Tolerance	20.4				22 0	0.94			8.7	

Table B-3.3
Trip Sample Records: Weekday Surface Green Line - C Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30573	C	831	0	DOOLAN	BARRETT	5	5/16/96	5:50	3688B	1									0		12		1

Sum	0
Mean	0
STDEV	0
COV	0
Tolenrance	0.0 %

30578	C	831	0	DEMPSEY	BARRETT	5	5/30/96	6:01	3680A	1									5		9		1
30567	C	831	0	DONOHOE	DEMPSEY	4	5/22/96	6:03	3609B	1									5		10		2
30556	C	831	0	SASSO	DONOHOE	4	4/24/96	6:11	3674A	1									4		3		3
30592	C	831	0	ANDON	SASSO	6	5/10/96	6:11	3649B	1									5		5		4
30600	C	831	0	DEMPSEY	DONOHOE	6	5/10/96	6:24	3691A	1									8		8		5
30594	C	831	0	DEMPSEY	DONOHOE	6	4/19/96	6:28	3622B	1									11		13		6
30580	C	831	0	DONOHOE	ANDON	5	5/30/96	6:43	3641A	1									3		8		7
30557	C	831	0	DONOHOE	ANDON	4	5/29/96	6:55	3630A	1									7		16		8
30553	C	831	0	DEMPSEY	ANDON	4	4/24/96	7:08	3643B	2									2		12		9
30560	C	831	0	BARRETT	ANDON	4	5/22/96	7:15	3685A	1									16		29		10
30585	C	831	0	ANDON	DOOLAN	5	5/9/96	7:16	3668B	2									3		8		11
30554	C	831	0	BARRETT	DOOLAN	4	4/24/96	7:21	3670A	2									1		8		12
30596	C	831	0	SASSO	ANDON	6	4/19/96	7:52	3621B	1									0		21		13
30597	C	831	0	SASSO	ANDON	6	4/19/96	8:14	3672A	1									13		33		14
30575	C	831	0	DEMPSEY	ANDON	5	5/16/96	8:18	3675A	1									10		19		15
30583	C	831	0	DEMPSEY	DONOHOE	5	5/9/96	8:46	3668	1									17		32		16

Sum	110
Mean	6.9
STDEV	5.2
COV	0.76
Tolenrance	41.6 %

Table B-3.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - C Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30598	C	831	0	DEMPSEY	DONOHOE	6	4/19/96	9:10	3640B	2									6		6	1
30552	C	831	0	DONOHOE	SASSO	4	4/24/96	9:29	3678B	1									11		10	2
30591	C	831	0	BARRETT	DOOLAN	6	4/19/96	9:30	3622B	2									5		5	3
30559	C	831	0	DEMPSEY	BARRETT	4	5/29/96	9:46	3448A	1									10		24	4
30577	C	831	0	DEMPSEY	BARRETT	5	5/30/96	9:50	3689B	2									5		10	5
30595	C	831	0	DEMPSEY	BARRETT	6	5/31/96	9:55	3630A	2									6		9	6
30563	C	831	0	BARRETT	ANDON	4	5/22/96	10:05	3608A	1									10		18	7
30586	C	831	0	ANDON	DOOLAN	5	5/9/96	10:06	3620B	1									3		6	8
30579	C	831	0	ANDON	DONOHOE	5	5/30/96	10:15	3651B	1									18		26	9
30593	C	831	0	SASSO	ANDON	6	5/10/96	10:29	3691B	1									17		26	10
30590	C	831	0	BARRETT	DOOLAN	6	5/10/96	10:42	3680B	1									9		17	11
30558	C	831	0	DONOHOE	ANDON	4	5/29/96	10:50	3682A	1									16		16	12
30555	C	831	0	BARRETT	DOOLAN	4	4/24/96	10:51	3698A	1									10		13	13
30574	C	831	0	BARRETT	SASSO	5	5/16/96	11:09	3671A	1									22		37	14
30566	C	831	0	DONOHOE	DEMPSEY	4	5/22/96	11:23	3601B	1									20		37	15
30589	C	831	0	BARRETT	DOOLAN	6	5/10/96	11:40	3696B	1									20		30	16
30587	C	831	0	ANDON	DOOLAN	5	5/9/96	12:12	3622A	1									21		41	17
30582	C	831	0	BARRETT	DONOHOE	5	4/25/96	12:16	3637A	1									28		72	18
30571	C	831	0	BARRETT	SASSO	4	5/15/96	12:25	3675B	1									5		17	19
30588	C	831	0	BARRETT	DOOLAN	6	5/10/96	12:25	3668A	1									12			20
30603	C	831	0	DONOHOE	DEMPSEY	6	5/10/96	12:30	3639A	1									12		19	21
30522	C	831	0	DONOHOE	DOOLAN	2	5/13/96	12:35	3693B	1									21		28	22
30570	C	831	0	DONOHOE	DOOLAN	4	5/15/96	12:40	3621B	1									22		41	23
30568	C	831	0	ANDON	DEMPSEY	4	5/15/96	13:05	3636A	1									29		33	24
30565	C	831	0	SASSO	DOOLAN	4	5/22/96	13:12	3673A	1									26		70	25
30550	C	831	0	DONOHOE	DOOLAN	4	5/8/96	13:21	3659B	1									18		28	26
30538	C	831	0	SASSO	DONOHOE	3	5/28/96	13:48	3663B	1									20		63	27
30599	C	831	0	DONOHOE	DEMPSEY	6	4/19/96	13:55	3655A	1									9		13	28

Sum	411
Mean	14.7
STDEV	7.5
COV	0.51
Tolenrance	21.4 %

Table B-3.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - C Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30515	C	831	0	ANDON	DEMPSEY	2	5/20/96	14:12	3601A	1									21		54	1
30508	C	831	0	BARRETT	SASSO	2	5/20/96	14:27	3619A	1									17		26	2
30541	C	831	0	BARRETT	SASSO	3	4/23/96	14:33	3643A	1									44		74	3
30532	C	831	0	DEMPSEY	ANDON	3	5/21/96	14:37	3653B	1									21		42	4
30520	C	831	0	BARRETT	SASSO	2	5/13/96	14:44	3684A	1									23		63	5
30572	C	831	0	BARRETT	SASSO	4	5/15/96	15:09	3688B	2									11		22	6
30542	C	831	0	DEMPSEY	ANDON	3	4/23/96	15:10	3690B	1									28		41	7
30527	C	831	0	DONOHOE	DOOLAN	3	5/21/96	15:26	3649A	2									5		10	8
30536	C	831	0	ANDON	DEMPSEY	3	5/28/96	15:26	3631A	1									46		52	9
30561	C	831	0	DONOHOE	DOOLAN	4	5/15/96	15:38	3675A	2									19		25	10
30513	C	831	0	DONOHOE	DOOLAN	2	5/20/96	15:43	3675A	2									10		25	11
30569	C	831	0	ANDON	DEMPSEY	4	5/15/96	15:44	3636	1									15		46	12
30581	C	831	0	DONOHOE	BARRETT	5	4/25/96	15:51	3691B	2									20		36	13
30521	C	831	0	DONOHOE	DOOLAN	2	5/13/96	15:55	3694A	1									31		18	14
30519	C	831	0	BARRETT	SASSO	2	5/13/96	15:57	3677A	2									8		14	15

Sum	319
Mean	21.3
STDEV	12.0
COV	0.56
Tolenrance	32.0 %

30530	C	831	0	BARRETT	SASSO	3	5/21/96	16:03	3614B	2									11		38	1
30564	C	831	0	SASSO	DOOLAN	4	5/22/96	16:17	3618A	1									23		71	2
30524	C	831	0	BARRETT	SASSO	3	5/14/96	16:20	3687B	2									12		27	3
30551	C	831	0	DONOHOE	DOOLAN	4	5/8/96	16:30	3678B	1									29		71	4
30531	C	831	0	BARRETT	SASSO	3	5/21/96	17:10	3601B	2									9		24	5
30517	C	831	0	ANDON	DEMPSEY	2	5/13/96	17:31	3423B	2									14		88	6
30525	C	831	0	DONOHOE	DEMPSEY	3	5/14/96	17:31	3658B	2									14		83	7
30584	C	831	0	BARRETT	SASSO	5	5/9/96	17:32	3668B	2									16		95	8
30518	C	831	0	BARRETT	SASSO	2	5/13/96	17:47	3618A	2									26		91	9
30523	C	831	0	BARRETT	SASSO	3	5/14/96	17:55	3603A	2									18		98	10
30539	C	831	0	BARRETT	SASSO	3	4/23/96	17:55	3619B	2									6		23	11
30528	C	831	0	ANDON	DEMPSEY	3	5/21/96	18:00	3686B	1									8		75	12

Sum	186
Mean	15.5
STDEV	7.3
COV	0.47
Tolenrance	29.8 %

Table B-3.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - C Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30504	C	831	0	DONOHOE	DEMPSEY	2	4/22/96	18:01	3640A	1									49			71	1
30509	C	831	0	BARRETT	SASSO	2	5/20/96	18:01	3651A	2									1			37	2
30540	C	831	0	ANDON	DEMPSEY	3	4/23/96	18:13	3608A	2									1			40	3
30526	C	831	0	DONOHOE	DOOLAN	3	5/21/96	18:44	3661A	1									0			69	4
30514	C	831	0	DONOHOE	DOOLAN	2	5/20/96	18:53		1									24			43	5
30529	C	831	0	DEMPSEY	ANDON	3	5/21/96	18:54	3632B	1									14			77	6
30503	C	831	0	DONOHOE	DEMPSEY	2	4/22/96	18:59	3626B	1									11			80	7
30543	C	831	0	DONOHOE	DEMPSEY	3	5/14/96	19:04	3444	1									10			31	8
30516	C	831	0	DEMPSEY	ANDON	2	5/13/96	19:07	3538A	2									18			44	9
30537	C	831	0	BARRETT	DOOLAN	3	5/28/96	19:17	3652A	1									11			41	10
30547	C	831	0	BARRETT	SASSO	3	5/7/96	19:48	3683A	1									32			53	11
30548	C	831	0	BARRETT	SASSO	4	5/8/96	20:01	3623B	1									38			96	12
30544	C	831	0	DONOHOE	DOOLAN	3	5/7/96	20:08	3616A	1									29			76	13
30495	C	831	0	SASSO	DOOLAN	2	5/6/96	20:31	3613A	1									13			51	14
30505	C	831	0	DONOHOE	DEMPSEY	2	4/22/96	21:20	3655	1									17			78	15
30500	C	831	0	BARRETT	ANDON	2	4/22/96	21:26	3628B	1									28			62	16
30498	C	831	0	BARRETT	ANDON	2	5/6/96	21:27	3698B	1									10			44	17
30496	C	831	0	DEMPSEY	DONOHOE	2	5/6/96	21:44	3613	1									16			54	18
30546	C	831	0	BARRETT	SASSO	3	5/7/96	21:55	3619A	1									10			45	19
30545	C	831	0	DEMPSEY	ANDON	3	5/7/96	22:02	3653B	1									16			29	20
30502	C	831	0	SASSO	DOOLAN	2	4/22/96	22:15	3608A	1									18			65	21
30549	C	831	0	BARRETT	SASSO	4	5/8/96	22:15	3634A	1									9			66	22
30499	C	831	0	BARRETT	ANDON	2	5/6/96	22:23	3612A	1									9			39	23
30497	C	831	0	SASSO	DOOLAN	2	5/6/96	23:03	3660A	1									10			24	24
30501	C	831	0	BARRETT	ANDON	2	4/22/96	23:15	3643A	1									4			23	25
30506	C	831	0	DEMPSEY	DONOHOE	2	4/23/96	0:04	3644A	1									2			11	26

Sum	400
Mean	15.4
STDEV	50.4
COV	3.28
Tolenrance	141.4 %

Table B-3.4
Trip Sample Records: Weekend Surface Green Line - C Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30393	C	831	0	BARRETT	ANDON	1	4/21/96	20:50	3645B	1									5			37	1
30479	C	831	0	DOOLAN	DONOHOE	1	5/12/96	15:57	3692B	1									15			69	2
30482	C	831	0	DONOHOE	SASSO	1	4/28/96	18:10	3668B	1									33			128	3
30483	C	831	0	DOOLAN	DONOHOE	1	5/12/96	18:24	3641A	1									12			37	4
30484	C	831	0	BARRETT	SASSO	1	5/19/96	18:39	3622B	1									12			41	5
30485	C	831	0	ANDON	DEMPSEY	1	5/19/96	17:32	3628B	1									6			38	6
30486	C	831	0	DONOHOE	DOOLAN	1	5/19/96	18:30	3622A	1									70			110	7
30487	C	831	0	DONOHOE	DOOLAN	1	5/19/96	14:00	3639A	1									27			50	8
30488	C	831	0	BARRETT	SASSO	1	5/19/96	20:45	3620B	1									38			66	9
30489	C	831	0	BARRETT	SASSO	1	5/19/96	22:51	3647A	1									10			45	10
30490	C	831	0	BARRETT	ANDON	1	4/21/96	22:54	3645B	1									3			60	11
30491	C	831	0	DONOHOE	SASSO	1	4/28/96	16:34	3665A	1									28			68	12
30492	C	831	0	BARRETT	DOOLAN	1	4/28/96	17:35	3647B	1									38			110	13
30493	C	831	0	BARRETT	DOOLAN	1	4/28/96	14:28	3668A	1									33			71	14
30494	C	831	0	DEMPSEY	ANDON	1	4/28/96	18:55	3620A	1									41			81	15
30605	C	831	0	DONOHOE	ANDON	7	5/11/96	10:40	3643B	1									52			62	16
30606	C	831	0	DEMPSEY	DOOLAN	7	5/11/96	9:47	3610A	1									7			8	17
30607	C	831	0	DEMPSEY	DOOLAN	7	5/11/96	12:13	3659A	1									22			32	18
30608	C	831	0	BARRETT	SASSO	7	5/11/96	8:20	3676A	1									15			29	19
30609	C	831	0	DEMPSEY	DONOHOE	7	4/20/96	9:56	3644A	1									5			32	20
30610	C	831	0	ANDON	DEMPSEY	7	5/18/96	8:13	3620A	1									15			18	21
30611	C	831	0	DEMPSEY	ANDON	7	5/18/96	11:47	3618A	1									12			36	22
30612	C	831	0	BARRETT	SASSO	7	5/18/96	18:12	3694A	1									9			52	23
30613	C	831	0	BARRETT	SASSO	7	5/18/96	22:25	3623B	1									5			53	24
30614	C	831	0	DONOHOE	DOOLAN	7	5/18/96	8:43	3685A	1									23			6	25
30615	C	831	0	SASSO	ANDON	7	4/20/96	20:24	3608B	1									6			83	26

Sum	542
Mean	20.8
STDEV	16.8
COV	0.81
Tolerance	34.8 %

Table B-4.1
Trip Sample Records: Weekday Surface Green Line - D Inbound

Rec. No.	Rte.	No.	Dir.	Obs	Rec	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Cash	Ad. Pass	Ad. Pass	10-Ride	Newton	C&C	Red.	Red.	St. 1/2	St. 1/2	St. Pass	St. Pass	Free	Free	Inb	Outb	PAX	Fare Box	FB Est	FB OK?	Used FB	Cor	Calc. of Fare Evation	Av FB	n
30337	D	852	1	DONOHOE	ANDON	6	5/31/96	5:01	3618A	1	31168.9	31178	0	3	2	9	7	0	0	0	2	0	0	0			1	0		16	24	9.4	8.4	NO	8.40	201.60		0.350	1
30305	D	852	1	BARRETT	DOOLAN	6	4/19/96	5:10	3677A	1	28564	28567	0	3	0	0	7	0	0	0	0	0	0	0			1			11	3.15	6	YES	6.00	66.00	3.15	6	0.545	2
30368	D	852	1	SASSO	ANDON	6	4/19/96	5:20	3662A	1	25894.1	25898	0	2	5	3	7	0	0	0	0	1	0	0						17	3.95	9.2	NO	9.20	156.40			0.511	3
													Sum	8	7	12	21	0	0	0	2	1	0	0	0	0	0	2	0	Mean	17.7				7.87	0.445			0.469	3
													%	0.151	0.132	0.226	0.396	0.000	0.000	0.000	0.038	0.019	0.000	0.000	0.000	0.000	0.038	0.000		STDEV	6.5				1.665	8.133			0.104	3
													53		0.283		0.623					0.057		0.000		0.000		0.038		COV	0.37				0.21	0.25			0.22	3
																													Tolerance	44.7				25.7	0.75			27.0	3
30339	D	852	1	DONOHOE	ANDON	5	5/30/96	6:00	3605B	1	19505.1	19506	0	0	2	9	8	0	0	0	0	0	0	0						16	19	1.25	2	YES	2.00	38.00	1.25	2	0.105	1
30341	D	852	1	ANDON	DONOHOE	4	5/29/96	6:10	3692A	1	930.22	951.8	0	7	7	13	20	0	0	0	0	0	0	0						41	47	18.6	21	YES	21.00	987.00	18.6	21	0.447	2
30366	D	852	1	ANDON	DEMPSEY	4	4/24/96	6:26	3664B	1	10173.2	10204	3	11	14	22	38	0	0	0	1	0	0	0	1	0	1	0		78	88	33.45	36.2	YES	36.20	3185.60	33.45	36.2	0.411	3
30344	D	852	1	BARRETT	ANDON	4	5/22/96	6:40	3604B	2	9125.57	9134	0	3	2	9	9	0	0	0	1	1	0	0						16	25	8.4	8.4	YES	8.40	210.00	8.4	8.4	0.336	4
30340	D	852	1	DEMPSEY	BARRETT	4	5/29/96	7:30	3677B	1	30055	30082	0	6	16	18	37	0	0	0	2	2	1	1	3	2		1		76	89	26.6	30.3	YES	30.30	2696.70	26.6	30.3	0.340	5
30304	D	852	1	DEMPSEY	BARRETT	5	5/30/96	7:30	3605B	2	19506.3	19534	0	11	5	17	29	2	0	0	4	2	2	1	4	0				55	77	28	30.7	YES	30.70	2363.90	28	30.7	0.399	6
30338	D	852	1	DEMPSEY	BARRETT	6	5/31/96	7:30	3685B	2	3066.89	3883	0	5	6	9	30	3	0	0	0	2	0	1	1	1					56	816.15	16.9	NO	16.90	980.20			0.291	7
30318	D	852	1	ANDON	DEMPSEY	5	5/16/96	7:36	3461A	2	25007.6	25031	2	10	15	26	22	3	0	0	0	0	2	0	2	0	1	0		54	81	25.9	37	YES	37.00	2997.00	25.9	37	0.457	8
30363	D	852	1	DONOHOE	SASSO	4	4/24/96	7:57	3680A	2	24311.1	24347	0	14	14	24	48	3	0	0	3	0	0	0			1			97	107	36.35	42.6	YES	42.60	4558.20	36.35	42.6	0.398	9
30353	D	852	1	BARRETT	DOOLAN	6	5/10/96	8:02		3	29880.9	29921	10	26	13	24	76	3	0	0	2	1	0	0						150	145	30.29	65.6	YES	65.60	9512.00	30.29	65.6	0.462	10
30365	D	852	1	DEMPSEY	DONOHOE	6	4/19/96	8:10	3613A	2	16288.6	16348	0	45	23	30	36	3	0	0	0	0	2	2			1	0		139	142	58.9	116	YES	116.00	16472.00	58.9	116	0.817	11
30358	D	852	1	DONOHOE	DEMPSEY	2	4/22/96	8:31	3689A	1	23852.3	23884	2	13	14	7	13	0	0	0	0	2	0	0			3			48	52	34.14	40.4	YES	40.40	2100.80	34.14	40.4	0.777	12
30306	D	852	1	BARRETT	DOOLAN	6	4/19/96	8:50	3415A	2	18943.7	18979	0	9	8	0	37	0	0	0	2	2	0	0			3	0			69	35.65	34.8	YES	34.80	2401.20	35.65	34.8	0.504	13
30347	D	852	1	DONOHOE	DEMPSEY	4	5/22/96	8:56	3679B	2	2578.48	2598	0	10	3	10	19	2	0	0	3	1	0	0			4	0		40	52	19.3	23.8	YES	23.80	1237.60	19.3	23.8	0.458	14
													Sum	170	142	218	422	19	0	0	18	13	15	5	11	3	14	1	Mean	75.1				36.12	0.481			0.442	14
													%	0.162	0.135	0.207	0.402	0.018	0.000	0.000	0.017	0.012	0.014	0.005	0.010	0.003	0.013	0.001	STDEV	37.8				27.816	905.891			0.180	14
													1051		0.297		0.609					0.029		0.019		0.013		0.014	COV	0.50				0.77	0.20			0.41	14
																													Tolerance	28.3				43.2	0.86			22.8	14
30373	D	852	1	ANDON	DEMPSEY	4	4/24/96	9:11	3628B	1	13771.7	13820	2	18	17	20	38	0	0	0	3	3	0	0	0	1	3	3		77	106	50.2	54.2	YES	54.20	5745.20	50.2	54.2	0.511	1
30332	D	852	1	DOOLAN	ANDON	5	5/9/96	9:20	3650A	2	28961.8	28996	0	13	7	15	13	1	0	0	8	0	0	2						42	59	34.51	35.6	YES	35.60	2100.40	34.51	35.6	0.603	2
30372	D	852	1	BARRETT	DOOLAN	4	4/24/96	9:30	3687A	2	10148.9	10191	3	20	7	6	27	0	0	0	6	2	0	0						50	68	44.6	48.6	YES	48.60	3304.80	44.6	48.6	0.715	3
30320	D	852	1	ANDON	SASSO	6	5/10/96	9:40	3647B	1	21719.7	21757	2	12	14	8	18	1	0	1	6	5	0	0			1	1		55	68	39.6	41.2	YES	41.20	2801.60	39.6	41.2	0.606	4
30317	D	852	1	DOOLAN	BARRETT	5	5/16/96	9:50	3696B	1	15644.8	15662	0	11	17	5	12	1	0	0	2	3	0	1			1	0		46	53	17	40.5	NO	40.50	2146.50			0.764	5
30367	D	852	1	SASSO	ANDON	6	4/19/96	10:10	3618B	2	27835.7	27897	0	21	20	8	8	0	0	1	0	3	4	2	0		1	0		49	66	61.25	66.8	YES	66.80	4408.80	61.25	66.8	1.012	6
30346	D	852	1	DONOHOE	DEMPSEY	4	5/22/96	10:40	3670A	2	1820.9	1865	2	20	14	6	8	0	0	0	0	3	4	0			1	0		48	58	45.64	58.4	YES	58.40	3387.20	45.64	58.4	1.007	7
30371	D	852	1	BARRETT	DONOHOE	5	4/25/96	11:32	3623A	1	4708.14	4751	0	16	22	4	13	0	0	0	2	3	1	0	1	0	1	1		51	64	43.35	56	YES	56.00	3584.00	43.35	56	0.875	8
30356	D	852	1	SASSO	DONOHOE	2	5/28/96	11:40	3626B	2	2817.37	2826	0	2	3	2	6	0	0	0	2	2	0	1						18	18	8.3	8.3	YES	8.30	149.40	8.3	8.3	0.461	9
30319	D	852	1	DEMPSEY	ANDON	5	5/16/96	11:40	3645B	2	33812.4	33843	5	13	10	6	5	0	0	0	3	3	0	0						33	40	33.85	37.2	YES	37.20	1488.00	33.85	37.2	0.930	10
30307	D	852	1	[illegible]	[illegible]	6	5/10/96	11:50	3608B	1	29879.3	29924	0	17	13	5	16	0	0	0	5	2	0	0			0	1		47	59	44.8	48.8	YES	48.80	2858.60	44.8	48.4	0.820	11
30316	D	852	1	DONOHOE	DOOLAN	4	5/15/96	12:00	3618B	1	30114.5	30162	1	17	20	4	12	1	0	0	2	2	0	2	2	0				50	62	48.75	55.8	YES	55.80	3459.60	48.75	55.8	0.900	12
30351	D	852	1	ANDON	DEMPSEY	2	5/20/96	12:10	3690B	2	6822.96	6857	0	13	17	3	12	0	0	0	4	0	0	0	0	1	1	0		45	51	29.05	43.8	YES	43.80	2233.80	29.05	43.8	0.659	13
30331	D	852	1	DONOHOE	DEMPSEY	5	5/9/96	12:19	3429B	2	1209.82	1249	6	16	13	8	3	0	1	0	2	1	0	2						39	44	44.85	45.6	YES	45.60	2006.40	44.85	45.6	1.036	14
30314	D	852	1	DEMPSEY	ANDON	4	5/15/96	12:20	3642A	2	23827.5	23862	1	14	6	6	4	0	0	0	3	1	2	1						21	37	35.05	37.3	YES	37.30	1580.10	35.05	37.3	1.008	15
30362	D	852	1	SASSO	BARRETT	2	5/20/96	12:20	3643A	2	30410.3	30407	0	7	9	5	9	0	0	0	1	5	5	0	0					22	41	26.55	26	YES	26.00	1066.00	26.55	26	0.634	16
30354	D	852	1	[illegible]	BARRETT	3	4/23/96	12:30	3627A	2	12913.6	12947	0	12	19	8	14	0	0	0	0	0	2	2	0					51	60	33.5	45.4	YES	45.40	2724.00	33.5	45.4	0.757	17
30355	D	852	1	DEMPSEY	ANDON	3	4/23/96	12:52	3687A	1	9877.04	9932	4	19	26	8	19	0	0	0	0	1	2	0	1					75	80	58.65	65.6	YES	65.60	5248.00	58.65	65.6	0.820	18
30369	D	852	1	DONOHOE	DEMPSEY	6	4/19/96	13:03	3677A	2	28781.4	28844	2	23	30	17	31	0	0	0	0	1	2	0	1					91	105	64.45	77.1	YES	77.10	8095.50	64.45	77.1	0.734	19
30357	D	852	1	DONOHOE	DOOLAN	2	5/20/96	13:28	3670B	2	14171.8	16209	3	13	13	1	5	0	0	0	0	2	1	0	3			1		30	37	34.5	39.1	YES	39.10	1446.70	34.5	39.1	1.057	20
30309	D	852	1	DEMPSEY	ANDON	2	5/13/96	13:58	3682B	2	30290.9	30429	6	14	6	9	14	0	0	0	0	1	1	0	14	0	1			33	54	41.75	41.4	YES	41.40	2235.60	41.75	41.4	0.767	21
													Sum	311	299	148	287	4	7	2	65	49	11	27	3	4	9	9	Mean	58.6				46.80	0.790			0.804	21
													%	0.253	0.243	0.120	0.233	0.003	0.002	0.002	0.053	0.040	0.009	0.022	0.002	0.003	0.007	0.007	STDEV	20.8				14.869	245.910			0.174	21
													1230		0.496		0.264					0.093		0.031		0.006		0.015	COV	0.36				0.32	0.08			0.22	21
																													Tolerance	16.3				14.7	0.79			9.9	21

Table B-4.1 (cont.)
Trip Sample Records: Weekday Surface Green Line - D Inbound

Rec No.	Rte.	No.	Dir.	Obs	Rev	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Cash	Ad. Pass	Ad. Pass	10-Ride	Newton	C&C	Red.	Red.	St. 1/2	St. 1/2	St. Pass	St. Pass	Free	Free	Inb	Outb	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor	Calc. of Fare Evation		Av. FB	n
30349	D	852	1	ANDON	DEMPSEY	3	5/21/96	14:00	3690B	2	7176.78	7188	0	1	13	3	15	1	0	0	0	0	0	2	0	1			30	36	10.95	16	YES	16.00	576.00	10.95	16	0.444	1
30312	D	852	1	BARRETT	SASSO	3	5/14/96	14:10	3519A	2	21846.1	21887	2	16	6	5	8	0	0	0	2	0	3	10	0	17			62	67	42.55	46.4	YES	46.40	3108.80	42.55	46.4	0.693	2
30313	D	852	1	BARRETT	SASSO	4	5/15/96	14:34	3519A	2	22094.1	22016	1	2	5	4	10	0	0	0	1	1	0	5	2	0	5	0	28	35	12.4	11.9	YES	11.90	416.50	12.4	11.9	0.340	3
30342	D	852	1	DEMPSEY	ANDON	3	5/28/96	14:48	3440A	2	1344.38	1363	2	8	5	6	13	0	0	0	1	0	0	0	1	0			21	34	20.55	21.2	YES	21.20	720.80	20.55	21.2	0.624	4
30315	D	852	1	DEMPSEY	ANDON	4	5/15/96	15:04	3683D	2	36835.9	36893	0	3	2	3	3	0	1	0	0	0	0	0					10	12	57	9	NO	9.00	108.00			0.750	5
30345	D	852	1	DOOLAN	SASSO	4	5/22/96	15:12	3691A	2	11156.2	11176	1	7	6	7	9	0	1	0	2	3	0	0					30	35	20.4	22	YES	22.00	770.00	20.4	22	0.623	6
30370	D	852	1	DONOHOE	BARRETT	5	4/25/96	15:20	3688B	1	31635.6	34660	2	6	12	7	6	0	0	0	2	4	4	2	1	1	1	0	32	46	3026.18	30.2	NO	30.20	1389.20			0.657	7
30348	D	852	1	BARRETT	SASSO	3	5/21/96	15:30	3463A	2	22514.2	22554	0	16	11	6	15	0	0	0	1	2	0	0	0	1	1	3	50	56	40.1	43.6	YES	43.60	2441.60	40.1	43.6	0.779	8
													Sum	59	60	41	79	1	2	0	9	10	7	19	4	20	7	3	Mean	40.1							0.614	8
													%	0.184	0.187	0.128	0.246	0.003	0.006	0.000	0.028	0.031	0.022	0.059	0.012	0.062	0.022	0.009	STDEV	16.5				25.04	0.624			0.150	8
													321		0.371		0.374					0.059		0.081		0.075		0.031	COV	0.41				13.954	213.409			0.24	8
																													Tolerance	30.5				41.4	0.93			18.1	8
30361	D	852	1	BARRETT	SASSO	5	5/9/96	16:05	3461B	2	24519	24536	1	5	8	7	9	0	0	3	1	1	0	0			2	1	0	23	37	17.7	21.4	YES	21.40	791.80	17.7	21.4	0.578	1
30311	D	852	1	DONOHOE	DEMPSEY	3	5/14/96	16:07	3535A	2	1710.07	1729	3	11	9	7	15	0	0	0	1	1	0	2			2	0	39	48	19.85	32.4	YES	32.40	1555.20	19.85	32.4	0.675	2
30375	D	852	1	DEMPSEY	ANDON	2	5/20/96	16:13	3603A	2	775.79	811.9	5	16	14	23	9	1	1	0	2	1	1	1					61	69	41.1	49.1	YES	49.10	3387.90	41.1	49.1	0.712	3
30329	D	852	1	DEMPSEY	ANDON	4	5/8/96	16:20	3649D	2	39541	39552	1	4	6	3	12	0	0	0	0	3	0	0			0	2	29	30	11.75	14.6	YES	14.60	438.00	11.75	14.6	0.487	4
30352	D	852	1	BARRETT	SASSO	2	5/20/96	16:26	3662A	1	29789.6	29805	0	4	4	7	2	0	2	0	0	0	0	1	1	0	4	0	17	25	13.45	14.5	NO	14.50	362.50			0.580	5
30374	D	852	1	BARRETT	SASSO	3	4/23/96	16:30	3679B	2	26376.7	26386	4	9	8	3	9	0	0	0	1	1	0	0	0	1			23	32	13.2	26.4	YES	26.40	844.80	13.2	26.4	0.825	6
30310	D	852	1	DEMPSEY	ANDON	2	5/13/96	16:50	3611A	2	22476	22505	2	8	18	6	65	0	0	0	3	1	0	1	4	1	1	0	77	88	31.15	35.3	YES	35.30	3106.40	31.15	35.3	0.401	7
30364	D	852	1	ANDON	DEMPSEY	3	4/23/96	16:56	3633A	2	14628.4	14641	1	4	6	4	10	0	0	0	0	0	0	0			2	0	21	24	13.55	14	YES	14.00	364.00	13.55	14	0.538	8
30343	D	852	1	BARRETT	DOOLAN	3	5/28/96	17:15	3643B	2	4660.79	4675	1	8	7	9	13	0	0	0	2	0	0	0	2	0			28	41	15.15	23.4	YES	23.40	959.40	15.15	23.4	0.571	9
30350	D	852	1	DONOHOE	DOOLAN	3	5/21/96	17:15	3515D	1	20772.7	20811	5	16	10	11	13	0	0	0	3	0	0	3	2	0			58	63.05	44.1	YES	44.10	2557.80	43.05	44.1	0.760	10
30006	D	852	1	DONOHOE	DOOLAN	2	5/20/96	17:30	3468B	1	0	0	2	24	19	0	9	0	0	0	1	0	2	1					45	56	n/a		69.7	NO	69.70	3903.20			1.245	11
30330	D	852	1	DEMPSEY	ANDON	4	5/21/96	17:45	3484B	2	20305.6	20329	3	10	5	12	8	0	0	0	3	0	0	0			3	0	28	41	26	25.6	YES	25.60	1049.60	26	25.6	0.624	12
30308	D	852	1	DONOHOE	DOOLAN	2	5/13/96	18:00	3659B	2	8527.8	8541	2	6	3	11	6	1	0	0	2	1	0	0					18	30	14.7	15.6	YES	15.60	468.00	14.7	15.6	0.520	13
30334	D	852	1	ANDON	BARRETT	2	5/6/96	18:00	3415A	1	19340.4	19351	3	8	5	18	6	0	0	0	5	0	1	0					25	43	13.55	23	YES	23.00	989.00	13.55	23	0.535	14
													Sum	133	122	121	166	2	3	3	24	9	4	9	9	4	13	2	Mean	44.6				29.22	0.656			0.647	14
													%	0.213	0.196	0.194	0.266	0.003	0.005	0.005	0.038	0.014	0.006	0.014	0.014	0.006	0.021	0.003	STDEV	18.0				15.944	195.648			0.205	14
													628		0.409		0.460					0.053		0.021		0.021		0.024	COV	0.40				0.55	0.15			0.32	14
																													Tolerance	22.6				30.6	0.68			17.8	14
30327	D	852	1	SASSO	BARRETT	4	5/8/96	18:05	3650A	2	28914.2	28919	3	1	3	9	2	0	1	0	2	0	0	0					11	18	7.41	6.4	NO	6.40	115.20			0.356	1
30333	D	852	1	BARRETT	ANDON	2	5/6/96	18:04	3656B	1	24155.2	24182	0	13	6	16	11	0	0	0	4	0	0	0					27	30	26.67	32.8	YES	32.80	1640.00	26.67	32.8	0.656	2
30328	D	852	1	DONOHOE	DOOLAN	4	5/8/96	18:43	3662A	1	28995.8	29046	2	26	14	9	14	0	0	0	2	0	0	0					84	65	52.4	66.4	YES	66.40	4316.00	52.4	66.4	1.022	3
30322	D	852	1	DEMPSEY	DONOHOE	2	5/6/96	18:44	3600B	1	23604.1	23641	4	20	16	10	20	0	2	0	1	2	1	0					44	70	40.79	57.6	YES	57.60	4032.00	40.79	57.6	0.823	4
30360	D	852	1	BARRETT	ANDON	2	4/22/96	19:11	3634B	1	22728	22753	4	12	7	7	11	0	0	0	0	1	0	0			1		27	39	26.75	31.2	YES	31.20	1216.80	26.75	31.2	0.800	5
30323	D	852	1	SASSO	DOOLAN	2	5/6/96	19:12	3685A	1	57436.2	57487	2	7	4	15	0	0	0	0	0	0	0	0	1	0	1	0	20	28	12.7	18	NO	18.00	504.00			0.643	6
30324	D	852	1	BARRETT	SASSO	3	5/7/96	19:12	3628A	1	15058.6	15094	7	16	9	16	17	0	2	0	1	0	0	0					38	61	42.3	43.2	YES	43.20	2635.20	42.3	43.2	0.708	7
30321	D	852	1	ANDON	BARRETT	2	5/6/96	19:28	3643	1	2102.59	2122	0	10	2	3	12	0	0	0	1	0	0	0	1	0			22	29	19.5	22.2	YES	22.20	643.80	19.5	22.2	0.766	8
30326	D	852	1	DONOHOE	DOOLAN	3	5/7/96	19:35	3608B	1	29063.6	29078	0	6	7	1	6	0	0	0	1	0	0	0					15	21	14.32	19.2	YES	19.20	403.20	14.32	19.2	0.914	9
30325	D	852	1	DEMPSEY	ANDON	3	5/7/96	19:50	3614B	1	11838.5	11859	2	6	12	4	20	0	0	0	0	0	0	0					31	42	22.08	24	YES	24.00	1008.00	22.08	24	0.571	10
30359	D	852	1	BASSO	DOOLAN	2	4/22/96	20:40	3634B	1	22758.7	22778	1	10	3	0	12	0	0	0	0	3	2	0	0				21	33	20.15	26	YES	26.00	858.00	20.15	26	0.788	11
													Sum	127	83	90	125	0	5	0	15	5	1	0	2	0	3	0	Mean	41.5				31.55	0.761	30.78	36.64	0.731	11
													%	0.279	0.182	0.197	0.274	0.000	0.011	0.000	0.033	0.011	0.002	0.000	0.004	0.000	0.007	0.000	STDEV	17.9				17.817	298.747	16.0 %		0.178	11
													456		0.461		0.471					0.044		0.002		0.004		0.007	COV	0.43				0.56	0.17			0.24	11
																													Tolerance	27.4				35.8	0.94			15.4	11

Table B-4.2
Trip Sample Records: Weekend Surface Green Line - D Inbound

Rec No	Rte.	No	Dir	Obs	Rec	Day	Date	Time	Veh No.	Car	Beg	End	Bills	Ad. Cash	Ad. Cash	Ad. Pass	Ad. Pass	10-Ride	Newtrax	C&C	Red.	Red.	St. 1/2	St. 1/2	St. Pass	St. Pass	Free	Free
30302	D	852	1	SASSO	DONOHOE	1	4/28/96	12:40	3641B	1	4006.78	4042.2	3	25	5	14	2	0	0	0	0	0	0	1	0	0	5	1
30300	D	852	1	DONOHOE	DOOLAN	1	5/19/96	13:22	3652A	1	24360.4	24223.9	8	31	11	9	2	0	0	0	0	0	4	0	6	0		
30290	D	852	1	BARRETT	DOOLAN	1	4/28/96	13:45	3661B	1	26994.1	27047	0	20	23	7	10	0	0	0	0	0	0	0				1
30297	D	852	1	DOOLAN	DONOHOE	1	5/12/96	14:45	3689A	1	26236	26288.3	0	17	23	10	14	0	0	0	0	3	0	0	2			1
30335	D	852	1	DEMPSEY	ANDON	1	4/28/96	15:36	3641B	1	4064.98	4089.58	6	14	7	7	13	0	0	0	0	3	2	0	0			1
30336	D	852	1	BARRETT	DOOLAN	1	4/28/96	16:02	3674A	1	31677.7	31732.4	4	18	26	3	17	0	0	0	0	2	2	0	0			12
30298	D	852	1	DONOHOE	DOOLAN	1	5/19/96	16:08	3696B	1	16646.5	16674.1	0	10	12	2	7	0	0	0	0	4	1	0	0			0
30295	D	852	1	DEMPSEY	ANDON	1	5/19/96	16:47	3653B	1	29695.9	29726.7	9	11	15	8	10	0	0	0	0	0	0	0	0			3
30296	D	852	1	BARRETT	ANDON	1	4/21/96	18:18	3689A	1	[illegible]	23468.7	1	4	5	5	10	2	0	0	0	3	0	0	0			
30303	D	852	1	DEMPSEY	DONOHOE	1	6/21/96	19:32	3677A	1	29324.7	29357.7	8	20	5	3	5	0	5	0	3	0	0	0	0			4
30301	D	852	1	BARRETT	SASSO	1	5/19/96	20:11	3679A	1	15963.7	16019.3	8	17	26	9	15	0	0	0	0	0	0	0	0			
30382	D	852	1	ANDON	DONOHOE	7	5/11/96	6:00	3627A	1	16590.9	16610	0	4	6	1	12	0	0	0	0	0	0	0	0			
30391	D	852	1	DEMPSEY	DONOHOE	7	4/20/96	6:50	3615A	1	26624.6	26627.8	0	0	4	1	3	0	0	0	0	0	0	0	0			0
30383	D	852	1	DEMPSEY	DOOLAN	7	5/11/96	7:00	3613B	1	18173.6	18194.2	2	9	6	2	6	0	0	0	0	1	0	0	0			
30380	D	852	1	DONOHOE	DOOLAN	7	5/18/96	7:20	3670B	1	15319.4	15340.3	1	11	10	16	5	2	0	0	0	1	2	0	0			
30381	D	852	1	DEMPSEY	ANDON	7	5/18/96	7:30	3697B	1	20730.3	20765.2	0	13	9	13	14	0	0	0	0	2	2	0	0			1
30384	D	852	1	BARRETT	SASSO	7	5/11/96	7:30	3627A	1	16601	16628.6	1	12	6	14	9	0	0	0	0	3	2	0	0			
30366	D	852	1	DEMPSEY	DONOHOE	7	4/20/96	7:50	3674B	1	[illegible]	20166.7	2	17	17	15	14	0	0	0	0	2	1	0	0			
30377	D	852	1	DONOHOE	ANDON	7	5/11/96	9:24	3697B	1	20264.2	20292.7	0	18	10	5	18	2	0	0	0	0	1	0	1			
30385	D	852	1	BARRETT	SASSO	7	5/11/96	10:05	3669A	1	19873.2	19947.4	1	28	15	7	11	0	0	0	0	5	2	0	3			
30378	D	852	1	ANDON	DEMPSEY	7	5/18/96	11:15	3645A	1	21528.9	21588.8	1	23	22	4	9	0	0	0	0	1	6	0	0			1
30387	D	852	1	DONOHOE	DEMPSEY	7	4/20/96	11:18	3694A	1	11985.7	12051.7	0	30	21	10	16	0	0	0	0	5	0	0	0	2		
30389	D	852	1	DOOLAN	DEMPSEY	7	5/11/96	11:24	3604B	1	8555.26	8646.21	3	34	25	7	25	0	0	0	0	7	1	2	0			
30376	D	852	1	SASSO	ANDON	7	4/20/96	19:40	3618B	1	28774.7	28888.8	0	37	53	5	26	0	0	0	0	0	1	0	1			2
30379	D	852	1	BARRETT	SASSO	7	5/18/96	19:40	3670B	1	15647.5	15717.9	4	24	26	9	14	0	1	0	0	0	0	0	0			1
30388	D	852	1	SASSO	ANDON	7	4/20/96	21:51	3664B	1	9246.63	[illegible]	3	4	16	2	5	0	0	0	1	0	0	0	0			1
													Sum	451	404	189	292	6	6	0	52	25	10	10	8	0	33	27
													%	0.298	0.267	0.124	0.193	0.004	0.004	0.000	0.034	0.017	0.007	0.007	0.005	0.000	0.022	0.018
													1512		0.565		0.317					0.051		0.013		0.005		0.040

Outb	Inb	PAX	Fare Box	FB Est	FB OK?	Used FB	Cor	Calc of Fare Evation		Av FB	n
67	53	38.42	55.5	YES	55.50	2941.50	38.42	55.5	1.047	1
58	63	71.45	77	YES	77.00	4851.00	71.45	77	1.222	2
60	75	52.9	69.6	YES	69.60	5220.00	52.9	69.6	0.928	3
61	73	52.3	57	YES	57.00	4161.00	52.3	57	0.781	4
44	51	30.6	36.6	YES	36.60	1866.60	30.6	36.6	0.718	5
55	77	58.64	63	YES	63.00	4851.00	58.64	63	0.818	6
58	49	27.6	32.8	YES	32.80	1607.20	27.6	32.8	0.669	7
48	50	39.83	38	YES	38.00	1900.00	39.83	38	0.760	8
16	29	10.8	13	YES	13.00	377.00	10.8	13	0.448	9
33	36	40.93	45.6	YES	45.60	1641.60	40.93	45.6	1.267	10
70	79	63.65	65.6	YES	65.60	5182.40	63.65	65.6	0.830	11
22	23	19.1	14	NO	14.00	322.00			0.609	12
8	8	3.22	4	YES	4.00	32.00	3.22	4	0.500	13
19	25	22.6	24.2	YES	24.20	605.00	22.6	24.2	0.968	14
40	47	21.9	32.6	YES	32.60	1532.20	21.9	32.6	0.694	15
31	54	34.9	35.8	YES	35.80	1933.20	34.9	35.8	0.663	16
30	47	28.59	31	YES	31.00	1457.00	28.59	31	0.660	17
59	66	47.9	51.6	YES	51.60	3405.60	47.9	51.6	0.782	18
47	55	28.52	46.7	YES	46.70	2568.50	28.52	46.7	0.849	19
65	73	77.2	73.9	YES	73.90	5394.70	77.2	73.9	1.012	20
63	66	60.85	69.4	YES	69.40	4580.40	60.85	69.4	1.052	21
75	84	66	82	YES	82.00	6888.00	66	82	0.976	22
86	101	93.95	96.6	YES	96.60	9756.60	93.95	96.6	0.956	23
105	125	114.01	127.7	YES	127.70	15962.50	114.01	127.7	1.022	24
68	75	74.39	75	YES	75.00	5625.00	74.39	75	1.000	25
19	26	24.35	24.2	YES	24.20	677.60	24.35	24.2	0.864	26
Mean		58.2			0.888	51.63	0.888	47.62	53.14	0.880	
STDEV		25.7				28.264	690.955	10.8 %		0.202	
COV		0.44				0.55	0.103			0.24	
Tolerance		18.2				22.5	0.95			9.8	

Table B-4.3
Trip Sample Records: Weekday Surface Green Line - D Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30768	D	852	0	BARRETT	SASSO	4	5/15/96	1:57	3407A	2									41			37	1
30763	D	852	0	ANDON	DEMPSEY	4	4/24/96	5:50	3612B	1									13			30	2

Sum	54
Mean	27.0
STDEV	19.8
COV	0.73
Tolenrance	114.1 %

30759	D	852	0	BARRETT	ANDON	4	5/22/96	6:03	3610A	1									15			45	1
30782	D	852	0	DEMPSEY	BARRETT	5	5/30/96	6:50	3605A	1									25			36	2
30789	D	852	0	DEMPSEY	BARRETT	6	5/31/96	6:50	3685B	1									35			55	3
30776	D	852	0	ANDON	DEMPSEY	5	5/16/96	6:54	3682A	1									37			71	4
30760	D	852	0	DEMPSEY	BARRETT	4	5/29/96	6:57	3692A	1									23			52	5
30764	D	852	0	DONOHOE	SASSO	4	4/24/96	7:08	3613A	1									51			66	6
30792	D	852	0	DOOLAN	BARRETT	6	5/10/96	7:20	3683A	1									43			37	7
30790	D	852	0	DEMPSEY		6	4/19/96	7:29	3658B	1									16			10	8
30788	D	852	0	DONOHOE	ANDON	6	5/31/96	7:56	3627B	1									9			21	9
30795	D	852	0	BARRETT	DOOLAN	6	4/19/96	8:00	3424B	2									4			17	10
30775	D	852	0	DONOHOE	DEMPSEY	4	5/22/96	8:02	3418B	1									18			31	11
30762	D	852	0	ANDON	DEMPSEY	4	4/24/96	8:28	3689A	2									11			55	12
30781	D	852	0	DOOLAN	ANDON	5	5/9/96	8:35	3451A	1									23			73	13
30761	D	852	0	BARRETT	DOOLAN	4	4/24/96	8:40	3633A	1									3			38	14
30791	D	852	0	ANDON	SASSO	6	5/10/96	8:47	3541B	2									7			30	15
30778	D	852	0	DOOLAN	BARRETT	5	5/16/96	8:55	3615B	1									28			32	16

Sum	348
Mean	21.8
STDEV	14.2
COV	0.65
Tolenrance	35.9 %

Table B-4.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - D Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30797	D	852	0	SASSO	ANDON	6	4/19/96	9:20	3689A	2									9			8	1
30774	D	852	0	DONOHOE	DEMPSEY	4	5/22/96	9:47	3679B	2									0				2
30787	D	852	0	DONOHOE	DONOHOE	6	5/31/96	10:35	3692A	2									5			13	3
30793	D	852	0	DEMPSEY	DONOHOE	6	5/10/96	10:55	3697B	1									31			76	4
30777	D	852	0	DEMPSEY	ANDON	5	5/16/96	11:02	3634A	1									14			31	5
30770	D	852	0	DONOHOE	DOOLAN	4	5/15/96	11:15	3615A	1									43			30	6
30772	D	852	0	DEMPSEY	ANDON	4	5/15/96	11:34	3526A	1									28			41	7
30779	D	852	0	DONOHOE	DEMPSEY	5	5/9/96	11:40	3645B	2									20			27	8
30786	D	852	0	BARRETT	DOOLAN	6	4/19/96	11:45	3469B	1									28			42	9
30755	D	852	0	DEMPSEY	ANDON	3	4/23/96	12:00	3616B	2									6			24	10
30796	D	852	0	SASSO	ANDON	6	4/19/96	12:12	3634B	1									33			60	11
30785	D	852	0	ANDON	DONOHOE	5	5/30/96	12:17	3697A	2									19				12
30794	D	852	0	DEMPSEY	DONOHOE	6	4/19/96	12:25	3642A	2									9			41	13
30745	D	852	0	DONOHOE	DOOLAN	2	5/20/96	12:50	3652A	1									52			76	14
30738	D	852	0	DEMPSEY	ANDON	2	5/13/96	13:10	3610B	1									11			36	15
30750	D	852	0	BARRETT	SASSO	3	5/14/96	13:32	3669A	1									32			75	16

Sum	340
Mean	21.3
STDEV	14.8
COV	0.69
Tolenrance	38.2 %

30758	D	852	0	DEMPSEY	ANDON	3	5/28/96	14:04	3679A	1									35			53	1
30771	D	852	0	DEMPSEY	ANDON	4	5/15/96	14:22	3618B	1									72			71	2
30773	D	852	0	DOOLAN	SASSO	4	5/22/96	14:35	3670A	2									14			29	3
30784	D	852	0	BARRETT	DONOHOE	5	4/29/96	14:38	3640A	2									68			83	4
30746	D	852	0	BARRETT	SASSO	3	5/21/96	14:58	3451A	2									19			49	5
30749	D	852	0	DONOHOE	DEMPSEY	3	5/14/96	15:26	3449A	1									13			61	6
30767	D	852	0	DEMPSEY	ANDON	4	5/8/96	15:27	3415A	1									27			46	7
30780	D	852	0	BARRETT	SASSO	5	5/9/96	15:27	3539B	2									67			45	8
30742	D	852	0	DEMPSEY	ANDON	2	5/20/96	15:32	3646A	1									29			49	9
30732	D	852	0	BARRETT	SASSO	2	4/23/96	15:53	3674A	1									6			76	10
30740	D	852	0	BARRETT	SASSO	2	5/20/96	15:54	3519A										19			35	11

Sum	369
Mean	33.5
STDEV	24.2
COV	0.72
Tolenrance	47.8 %

Table B-4.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - D Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30737	D	852	0	DEMPSEY	ANDON	2	5/13/96	16:13	3699B	1										14		35	1
30753	D	852	0	ANDON	DEMPSEY	3	3/23/96	16:13	3669B	1										37		50	2
30747	D	852	0	DONOHOE	DOOLAN	3	5/21/96	16:32	3645A	1										17		28	3
30757	D	852	0	BARRETT	DOOLAN	3	5/28/96	16:33	3643B	2										25		65	4
30743	D	852	0	DONOHOE	DOOLAN	2	5/20/96	16:55	3539B	2										22		35	5
30766	D	852	0	DEMPSEY	ANDON	4	5/8/96	17:01	3415A	1										83		47	6
30739	D	852	0	DONOHOE	DOOLAN	2	5/13/96	17:20	3689B	2										19		150	7
30756	D	852	0	SASSO	DONOHOE	3	5/28/96	17:56	3697B	1										17		52	8
																			Sum	234			
																			Mean	29.3			
																			STDEV	22.9			
																			COV	0.78			
																			Tolenrance	60.8 %			
30765	D	852	0	DONOHOE	DOOLAN	4	5/8/96	18:02	3632B	1										19		42	1
30735	D	852	0	DEMPSEY	DONOHOE	2	5/6/96	18:03	3642B	2										13		63	2
30783	D	852	0	DONOHOE	BARRETT	5	4/25/96	18:05	3612B	1										23		104	3
30741	D	852	0	DEMPSEY	ANDON	2	5/20/96	18:08	3519A	2										63		125	4
30731	D	852	0	BARRETT	ANDON	2	4/22/96	18:25	3449B	1										12		32	5
30748	D	852	0	BARRETT	SASSO	3	5/7/96	18:34	3662A	1										5		48	6
30734	D	852	0	SASSO	DOOLAN	2	5/6/96	18:36	3685A	1										12		95	7
30733	D	852	0	ANDON	BARRETT	2	5/6/96	18:47	3643B	1										12		68	8
30744	D	852	0	BARRETT	SASSO	2	5/20/96	18:55	3423A	2										6		38	9
30752	D	852	0	DONOHOE	DOOLAN	3	5/7/96	18:55		1										8		28	10
30754	D	852	0	BARRETT	SASSO	3	4/23/96	19:00	3629A	2										7		56	11
30751	D	852	0	DEMPSEY	ANDON	3	5/7/96	19:12	3614B	1										44		140	12
30729	D	852	0	DONOHOE	DEMPSEY	2	4/22/96	19:49	3689A	1										13		80	13
30730	D	852	0	SASSO	DOOLAN	2	4/22/96	20:02	3634B	1										20		90	14
30769	D	852	0	BARRETT	SASSO	4	5/8/96	22:58	3641A	1										8		66	15
30736	D	852	0	BARRETT	ANDON	2	5/6/96	23:10	3627A	1										9		52	16
																			Sum	274			
																			Mean	17.1			
																			STDEV	15.5			
																			COV	0.90			
																			Tolenrance	49.7 %			

Table B-4.4
Trip Sample Records: Weekend Surface Green Line - D Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30718	D	852	0	BARRETT	SASSO	1	5/19/96	19:35	3642	1									12		68	1
30719	D	852	0	DONOHOE	DOOLAN	1	5/19/96	12:40	3440A	1									60		78	2
30720	D	852	0	DONOHOE	DOOLAN	1	5/19/96	15:39	3696B	1									16		39	3
30721	D	852	0	DEMPSEY	ANDON	1	5/19/96	15:57	3609A	1									85		150	4
30722	D	852	0	DOOLAN	DONOHOE	1	5/10/96	14:05	3626	1									23		73	5
30723	D	852	0	DEMPSEY	ANDON	1	4/28/96	14:53	3646B	1									19		27	6
30724	D	852	0	BARRETT	DOOLAN	1	4/28/96	13:10	3652A	1									10		18	7
30725	D	852	0	BARRETT	DOOLAN	1	4/28/96	15:29	3674A	1									56		120	8
30726	D	852	0	DONOHOE	SASSO	1	4/28/96	19:10	3663	1									28		36	9
30727	D	852	0	DEMPSEY	DONOHOE	1	4/21/96	18:54	3685A	1									6		97	10
30728	D	852	0	BARRETT	ANDON	1	4/21/96	17:35	3674A	1									18		90	11
30798	D	852	0	DEMPSEY	DONOHOE	7	4/20/96	7:22	3674	1									11		14	12
30799	D	852	0	DONOHOE	DEMPSEY	7	4/20/96	10:42	3600B	1									3		24	13
30800	D	852	0	DONOHOE	DEMPSEY	7	4/20/96	12:13	3600A	1									8		15	14
30801	D	852	0	SASSO	ANDON	7	4/20/96	18:57	3699A	1									8		48	15
30802	D	852	0	SASSO	ANDON	7	4/20/96	21:19	3687B	1									30		57	16
30803	D	852	0	DOOLAN	DONOHOE	7	5/18/96	6:35	3679A	1									10		18	17
30804	D	852	0	DEMPSEY	ANDON	7	5/18/96	6:45	3670B	1									10		20	18
30805	D	852	0	ANDON	DEMPSEY	7	5/18/96	10:36	3615B	1									11		37	19
30806	D	852	0	BARRETT	SASSO	7	5/18/96	19:01	3643A	1									16		56	20
30807	D	852	0	BARRETT	SASSO	7	5/11/96	9:29	3663B	1									15		17	21
30808	D	852	0	DONOHOE	ANDON	7	5/11/96	11:31	3663B	1									20		60	22
30809	D	852	0	ANDON	DONOHOE	7	5/11/96	8:38	3650A	1									11		51	23
30810	D	852	0	DEMPSEY	DOOLAN	7	5/11/96	6:21	3613B	1									13		28	24
30811	D	852	0	DEMPSEY	DOOLAN	7	5/11/96	10:48	3627A	1									25		27	25
30812	D	852	0	BARRETT	SASSO	7	5/11/96	6:47	3627A	1									12		26	26

Sum	536
Mean	20.6
STDEV	18.8
COV	0.91
Tolenrance	39.4 %

Table B-5.1
Trip Sample Records: Weekday Surface Green Line - E Inbound

Rec No.	Probl	Rte	No.	Dir	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor.	Calc. of Fare Evation		Av. FB	n
30258		E	880	1	DEMPSEY	ANDON	4	4/24/96	5:30	3649B	1	3710086	3710781	0	11	22	0	0				33		33	6.95	9.35	YES	9.35	308.55	6.95	9.35	0.283	1
30248		E	880	1	DONOHOE	DEMPSEY	4	5/22/96	5:40	3652A	1	2506402	2506637	0	3	9	1	0				12		13	2.05	2.75	YES	2.75	35.75	2.05	2.75	0.212	2
30250		E	880	1	BARRETT	ANDON	4	5/22/96	5:50	3619A	1	2250045	2251151	0	4	9	3	0			2	17		18	11.06	4	NO	4.00	72.00			0.222	3
30283		E	880	1	SASSO	ANDON	6	5/10/96	5:50	3690A	1	2148038	2148486	1	6	14	1	0			2	18		23	5.48	5.3	YES	5.30	121.90	5.48	5.3	0.230	4
														Sum	24	54	5	0	0	4	0	Mean		21.8				5.35	0.246			0.237	4
														%	0.276	0.621	0.057	0.000	0.000	0.046	0.000	STDEV		8.5				2.863	24.250			0.037	4
														87								COV		0.39				0.54	0.28			0.13	4
																						Tolerance		41.2				56.2	0.99			14.1	4
30278		E	880	1	BARRETT	DOOLAN	6	4/19/96	6:00	3665B	1	1354056	1355756	2	14	2	1	0			4	28		21	19	12.1	NO	12.10	254.10			0.576	1
30241		E	880	1	DEMPSEY	BARRETT	4	5/29/96	6:20	3600A	1	2745285	2745990	0	14	23	1	0				23		38	7.05	12.1	YES	12.10	459.80	7.05	12.1	0.318	2
30270		E	880	1	DEMPSEY	ANDON	5	5/16/96	6:30	3670B	1	1496928	1498141	0	23	36	1	0	1			55		61	12.13	19.75	YES	19.75	1204.75	12.13	19.75	0.324	3
30280		E	880	1	BARRETT	DEMPSEY	6	5/31/96	6:30	3654A	1	2977308	2977918	0	15	28	5	0	1			37		49	6.15	13.75	NO	13.75	673.75			0.281	4
30284		E	880	1	DOOLAN	BARRETT	6	5/10/96	7:00	3681B	1	2922396	2923366	4	28	44	2	2	5			62		81	13.7	25	YES	25.00	2025.00	13.7	25	0.309	5
30267		E	880	1	BARRETT	SASSO	5	5/9/96	7:11	3607A	1	221300	225590	2	50	61	2	0				87		113	44.9	42.9	YES	42.90	4847.70	44.9	42.9	0.380	6
30247		E	880	1	DONOHOE	DEMPSEY	4	5/22/96	7:25	3611A	1	2303059	2303679	0	13	19	1	0	2			31		35	6.2	11.25	YES	11.25	393.75	6.2	11.25	0.321	7
30279		E	880	1	SASSO	ANDON	6	4/19/96	7:28		1	1355966	1357001	0	17	30	0	0			1	44		48	10.35	14.45	YES	14.45	693.60	10.35	14.45	0.301	8
30293		E	880	1	ANDON	DONOHOE	6	5/31/96	7:36		1	1974672	1974927	0	12	37	0	0	5			47		54	2.55	10.2	NO	10.20	550.80			0.189	9
30268		E	880	1	DEMPSEY	DONOHOE	5	5/9/96	8:16	3686B	2	220723	221828	0	24	24	0	0				37		48	11.05	20.4	YES	20.40	979.20	11.05	20.4	0.425	10
30271		E	880	1	DOOLAN	BARRETT	5	5/16/96	8:32	3654B	1	2594084	2595169	0	14	34	2	2			2	48		54	10.85	13.1	YES	13.10	707.40	10.85	13.1	0.243	11
														Sum	224	338	15	4	14	7	0	Mean		54.7				17.73	0.324			0.333	11
														%	0.372	0.561	0.025	0.007	0.023	0.012	0.000	STDEV		24.6				9.527	211.803			0.102	11
														602								COV		0.45				0.54	0.17			0.31	11
																						Tolerance		28.5				34.0	0.90			19.3	11
30259		E	880	1	DONOHOE	SASSO	4	4/24/96	9:05	3685A	2	3674760	3675589	1	15	18	0	1				30		34	9.29	13.15	YES	13.15	447.10	9.29	13.15	0.387	1
30269		E	880	1	DONOHOE	ANDON	5	5/30/96	9:52	3636B	2	132855	137005	2	19	14	1	0				33		34	43.5	16.35	NO	16.35	555.90			0.481	2
30282		E	880	1	ANDON	DONOHOE	6	5/31/96	10:15	3674B	2	2219396	2220170	0	14	10	1	0	1	2		27		28	7.74	12.1	YES	12.10	338.80	7.74	12.1	0.432	3
30276		E	880	1	DONOHOE	DEMPSEY	6	5/10/96	10:17	3628A	2	1584845	1585800	0	19	16	3	0		7		33		45	9.55	16.75	YES	16.75	753.75	9.55	16.75	0.372	4
30252		E	880	1	DONOHOE	ANDON	4	5/29/96	10:30	3675B	1	3251775	3252300	1	13	11	3	0	1			25		28	6.25	11.65	YES	11.65	326.20	6.25	11.65	0.416	5
30255		E	880	1	BARRETT	DOOLAN	4	4/24/96	10:32	3642A	1	1998444	2000205	0	23	32	7	0				52		62	17.61	20.95	YES	20.95	1298.90	17.61	20.95	0.338	6
30272		E	880	1	DARRETT	SASSO	5	5/16/96	10:48	3613A	1	1962090	1963575	1	28	17	3	0			1	35		49	15.85	24.4	YES	24.40	1195.60	15.85	24.4	0.498	7
30263		E	880	1	DEMPSEY	BARRETT	5	5/30/96	11:14	3629A	1	3361844	3361929	0	18	13	2	2				27		35	0.65	16.5	NO	16.50	577.50			0.471	8
30281		E	880	1	BARRETT	DEMPSEY	6	5/31/96	11:14	3665A	2	3135240	3136127	0	14	11	3	0				28		28	8.87	12.5	YES	12.50	350.00	8.87	12.5	0.446	9
30277		E	880	1	BARRETT	DOOLAN	6	4/19/96	11:20	3610B	2	2934576	2935411	1	12	13	2	2				29		29	9.35	11.4	YES	11.40	330.60	9.35	11.4	0.393	10
30253		E	880	1	DONOHOE	SASSO	4	4/24/96	11:25	3604A	1	2425274	2427874	0	49	35	7	2	4	2		98		99	26	43.85	YES	43.85	4341.15	26	43.85	0.443	11
30273		E	880	1	ANDON	DONOHOE	5	5/30/96	11:41	3674B	1	2203665	2205922	2	37	41	8	0		3		101		109	24.57	50.05	NO	50.05	5455.45			0.459	12
30262		E	880	1	DOOLAN	ANDON	5	5/9/96	11:50	3690A	1	2133339	2134801	0	32	29	7	0	2			62		70	14.62	28.6	YES	28.60	2002.00	14.62	28.6	0.409	13
30242		E	880	1	BARRETT	SASSO	4	5/15/96	12:00	3616A	2	3241568	3243254	2	28	2	4	0		1		38		35	18.86	24.6	YES	24.60	861.00	18.86	24.6	0.703	14
30254		E	880	1	BARRETT	DOOLAN	4	4/24/96	12:40	3632B	1	1814461	1818131	4	65	53	7	0				90		125	40.7	56.65	YES	56.65	7081.25	40.7	56.65	0.453	15
30244		E	880	1	ANDON	DEMPSEY	5	5/16/96	12:40	3684A	2	3491048	3492958	3	28	20	2	3	1			43		54	22.1	25.4	YES	25.40	1371.60	22.1	25.4	0.470	16
30249		E	880	1	DOOLAN	SASSO	4	5/22/96	12:42	3637A	1	4026787	4029078	1	38	32	9	0	2	4		40		65	23.91	34.1	YES	34.10	2898.50	23.91	34.1	0.401	17
30265		E	880	1	BARRETT	DONOHOE	5	4/25/96	12:50		1	3717490	3717890	0	39	21	10	4				66		74	4	36.75	NO	36.75	2719.50			0.497	18
30261		E	880	1	DONOHOE	DOOLAN	4	5/8/96	13:02	3680B	2	1671177	1673262	2	32	19	9	13	2			63		75	22.85	34.2	YES	34.20	2565.00	22.85	34.2	0.456	19
30230		E	880	1	BARRET	SASSO	3	5/21/96	13:11	3644B	1	2873195	2874735	0	28	13	8	1		4		37		54	15.4	25.8	YES	25.80	1393.20	15.4	25.8	0.478	20
30275		E	880	1	DEMPSEY	DONOHOE	5	5/9/96	13:14	3654B	2	2543639	2544574	0	24	18	5	1				42		48	9.35	21.8	NO	21.80	1046.40			0.454	21
30257		E	880	1	DEMPSEY	ANDON	4	5/8/96	13:20	3686B	2	212237	214306	2	39	25	2	0	7			67		73	22.69	33.55	YES	33.55	2449.15	22.69	33.55	0.460	22
30234		E	880	1	DEMPSEY	ANDON	3	5/28/96	13:38	3658B	1	3036995	3038409	0	23	17	4	0	2					46	14.14	20.35	YES	20.35	936.10	14.14	20.35	0.442	23
30266		E	880	1	BARRETT	SASSO	5	5/9/96	13:38	3667B	1	281904	285370	2	37	34	0	4			3	60		78	36.66	33.05	NO	33.05	2577.90			0.424	24
														Sum	694	514	107	33	22	27	0	Mean		58.2				26.02	0.447			0.449	24
														%	0.497	0.368	0.077	0.024	0.016	0.019	0.000	STDEV		27.3				12.348	327.019			0.067	24
														1397								COV		0.47				0.47	0.10			0.15	24
																						Tolerance		20.1				20.3	0.97			6.4	24

Table B-5.1 (cont.)
Trip Sample Records: Weekday Surface Green Line - E Inbound

Rec No.	Probl.	Rte	No	Dir.	Obs	Rec	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor.	Calc. of Fare Evation		Av. FB	n
																											YES					1
30005	1	E	880	1	DONOHOE	DOOLAN	4	5/15/96	14:32		2	0	0	0	1		1	0						2			YES					1
30237		E	880	1	DONOHOE	DEMPSEY	3	5/14/96	14:52	3644A	1	2258602	2260948	0	42	40	4	0	13	1		95		100	23.46	36.5	YES	36.50	3650.00	23.46	36.5	0.365	1
30236		E	880	1	DONOHOE	DOOLAN	3	5/21/96	14:58	3603A	2	97957	99547	5	41	24	4	0	11			47		80	20.9	35.65	YES	35.65	2852.00	20.9	35.65	0.446	2
30243		E	880	1	DONOHOE	DOOLAN	4	5/15/96	15:13	3639A	2	1379398	1382182	0	40	30	6	0		1				77	27.84	35.2	YES	35.20	2710.40	27.84	35.2	0.457	3
30232		E	880	1	DONOHOE	SASSO	3	5/28/96	15:26	3618B	1	3171333	3174033	0	47	36	8	2	1			75		94	27	42.35	YES	42.35	3980.90	27	42.35	0.451	4
30216		E	880	1	DONOHOE	DOOLAN	2	5/13/96	15:35	3654A	1	2863391	2865281	4	37	24	5	3		5		35		74	22.9	33.65	YES	33.65	2490.10	22.9	33.65	0.455	5
														Sum	207	154	27	5	25	7	0	Mean		85.0				36.67	0.431			0.435	5
														%	0.487	0.362	0.064	0.012	0.059	0.016	0.000	STDEV		11.4				3.340	24.662			0.039	5
														425								COV		0.13				0.09	0.07			0.09	5
																						Tolerance		12.5				8.6	0.65			8.5	5
30256		E	880	1	DONOHOE	DOOLAN	4	5/8/96	16:10	3645A	1	2072827	2073452	0	9	16	1	2		1		19		29	6.25	8.65	YES	6.25	181.25	6.25	8.65	0.216	1
30246		E	880	1	BARRETT	SASSO	4	5/15/96	16:21	3670B	2	1485192	1487612	2	28	38	2	0		2		62		70	26.2	24.2	NO	16.38	1146.50			0.234	2
30245		E	880	1	DEMPSEY	ANDON	4	5/15/96	16:55	3645A	1	2141890	2143470	0	35	43	5	0	4	1		84		91	15.8	31.35	YES	15.80	1437.80	15.8	31.35	0.174	3
30264		E	880	1	BARRETT	SASSO	5	5/9/96	17:03	3664A	2	2333914	2335321	1	32	57	1	0	6	2		90		98	15.07	27.4	YES	15.07	1476.86	15.07	27.4	0.154	4
30240		E	880	1	DONOHOE	DEMPSEY	3	5/14/96	17:07	3635B	2	2363318	2364791	0	28	52	0	7	1	5		74		93	14.73	26.6	YES	14.73	1369.89	14.73	26.6	0.158	5
30220		E	880	1	BARRETT	SASSO	2	5/13/96	17:21	3606B	2	2004463	2005678	1	18	28	4	0	1		1	46		52	13.15	16.1	YES	13.15	683.80	13.15	16.1	0.253	6
30226		E	880	1	BARRETT	SASSO	3	4/23/96	17:35	3635A	1	3351712	3352432	0	13	13	1	0				22		27	7.2	11.25	YES	7.20	194.40	7.2	11.25	0.267	7
30233		E	880	1	DEMPSEY	ANDON	3	5/21/96	17:36	3679B	2	247175	248260	0	18	20	0	0				33		38	10.85	15.3	YES	10.85	412.30	10.85	15.3	0.286	8
30274		E	880	1	DONOHOE	BARRETT	5	4/25/96	17:36	3660A	2	2155940	2159720	2	59	42	2	0	3	1		79		107	39.8	30.55	YES	39.80	4258.60	39.8	30.55	0.372	9
30214		E	880	1	BARRETT	SASSO	2	5/20/96	17:37	3699A	2	3083059	3083984	0	17	27	0	0	2			45		46	9.25	14.45	YES	9.25	425.50	9.25	14.45	0.201	10
30227		E	880	1	DEMPSEY	ANDON	3	4/23/96	17:54	3681B	2	2805682	2806272	0	9	9	0	0		1		11		19	5.9	7.65	YES	5.90	112.10	5.9	7.65	0.311	11
30251		E	880	1	SASSO	DOOLAN	4	5/22/96	17:54	3628B	2	1475446	1476356	0	28	21	2	0				33		51	9.1	24.2	NO	16.38	835.30			0.321	12
														Sum	294	366	21	9	17	13	1	Mean		60.1				14.23	0.237			0.245	12
														%	0.408	0.508	0.029	0.012	0.024	0.018	0.001	STDEV		30.7				8.977	206.786			0.069	12
														721								COV		0.51				0.63	0.19			0.28	12
																						Tolerance		31.0				38.2	0.75			17.0	12
30003	1	E	880	1	DEMPSEY	ANDON	3	5/7/96	18:44	3602B	1	2911849	2913815	0	22	27	2	0	1	15		68		77	19.66	27.6	YES	27.60	2125.20	19.66	27.6	0.358	1
30231		E	880	1	ANDON	DEMPSEY	3	5/28/96	18:05	3644B	1	2885321	2887501	1	37	35	0	0			1	61		73	22.8	31.45	YES	31.45	2295.85	22.8	31.45	0.431	2
30225		E	880	1	DONOHOE	DOOLAN	3	5/7/96	18:19	3686A	1	1667385	1668335	0	18	20	1	0	1	2		29		42	9.5	15.5	YES	15.50	651.00	9.5	15.5	0.369	3
30235		E	880	1	DONOHOE	DOOLAN	3	5/21/96	18:19	3690B	2	724033	724598	1	13	12	0	0	1	1		19		27	6.55	11.05	YES	11.05	298.35	6.55	11.05	0.409	4
30218		E	880	1	DONOHOE	DOOLAN	2	5/20/96	18:36	3681B	1	3046672	3047392	0	18	28	0	1		7		33		54	7.2	15.7	NO	15.70	847.80			0.291	5
30215		E	880	1	DEMPSEY	ANDON	2	5/13/96	18:44	3606	1	2005676	2006741	3	29	29	0	0		1		59		61	13.65	24.65	YES	24.65	1454.35	13.65	24.65	0.418	6
30228		E	880	1	DEMPSEY	ANDON	3	5/28/96	18:56	3656B	1	2602783	2603363	2	19	21	0	0				37		40	8.1	16.15	YES	16.15	646.00	8.1	16.15	0.404	7
30217		E	880	1	DONOHOE	DOOLAN	2	5/13/96	19:01	3681A	1	2162492	2164010	2	32		2	0		1		51		35	17.16	27.6	YES	27.60	966.00	17.16	27.6	0.789	8
30238		E	880	1	BARRETT	SASSO	3	5/14/96	19:10	3684B	1	3056209	3057261	0	29	32	6	1				90		68	10.52	26.25	NO	26.25	1785.00			0.386	9
30229		E	880	1	DEMPSEY	ANDON	3	5/28/96	19:20	3674B	1	2167697	2167642	0	21	17	1	0				39		39	-0.55	18.05	NO	18.05	703.95			0.463	10
30223		E	880	1	SASSO	DOOLAN	2	5/6/96	20:10	3645A	1	2041238	2041593	0	16	40	1	0		2		51		59	3.55	13.8	NO	13.80	814.20			0.234	11
30221		E	880	1	DEMPSEY	DONOHOE	2	5/6/96	21:19	3664A	1	2294679	2295661	1	23	31	3	0				35		57	10.82	20.15	YES	20.15	1148.55	10.82	20.15	0.354	12
30239		E	880	1	BARRETT	SASSO	3	5/7/96	21:30	3602A	1	2916620	2917335	0	18	25	1	0				32		44	7.15	15.5	NO	15.50	682.00			0.352	13
30004		E	880	1	SASSO	DOOLAN	2	4/22/96	21:50	3691B	1	3215522	0	2	72	55	8	0		2		169		137	n/a	62.8	NO	62.80	8603.60			0.458	14
30260		E	880	1	BARRETT	SASSO	4	5/8/96	21:50	3689A	1	2572959	2573079	3	40	64	0	0		3		80		107	24.2	34	YES	34.00	3638.00	24.2	34	0.318	15
30219		E	880	1	BARRETT	ANDON	2	4/22/96	23:00	3656A	1	3751654	3751979	0	7	11	1	0				15		19	3.25	6.15	YES	6.15	116.85	3.25	6.15	0.324	16
30224		E	880	1	DEMPSEY	ANDON	3	5/7/96	23:10	3618A	1	2948823	2949243	0	5	7	0	0				12		15	4.2	6.8	YES	6.80	102.00	4.2	6.8	0.453	17
30222		E	880	1	DEMPSEY	DONOHOE	2	5/6/96	23:20	3668B	1	814971	815941	0	12	8	0	0		1		13		21	9.7	10.2	YES	10.20	214.20	9.7	10.2	0.486	18
														Sum	444	462	26	2	3	35	1	Mean		54.1				21.30	0.394	15.11	22.33	0.405	18
														%	0.456	0.475	0.027	0.002	0.003	0.036	0.001	STDEV		31.1				13.202	374.588	32.8 %		0.116	18
														973								COV		0.58				0.62	0.15			0.29	18
																						Tolerance		28.5				30.7	0.91			14.2	18

Table B-5.2
Trip Sample Records: Weekend Surface Green Line - E Inbound

Rec. No.	Probl.	Rte	No	Dir.	Obs	Rec	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	PAX	Fare Box	FB Est.	FB OK?	Used FB	Cor	Calc. of Fare Evation		Av. FB	n
30210		E	880	1	DOOLAN	DONOHOE	1	5/12/96	5:48	3604A	1	2580900	2582855	3	40	14	2	0		2		47	58	22.55	34.4	YES	34.40	1995.20	22.55	34.4	0.593	1
30208		E	880	1	DONOHOE	DOOLAN	1	5/19/96	12:22	3684A	1	3521849	3522924	1	31	24	1	0		6		51	62	11.75	26.55	NO	26.55	1646.10			0.428	2
30011		E	880	1	DONOHOE	DEMPSEY	1	4/21/96	12:26	3669A	1	1774089	1774624	1	15	1	1	3				2	20	6.35	14.15	NO	14.15	283.00			0.708	3
30213		E	880	1	DEMPSEY	ANDON	1	5/19/96	12:35	3690A	1	2238179	2239725	0	22	10	3	2					37	15.46	20.1	YES	20.10	743.70	15.46	20.1	0.543	4
30206		E	880	1	DONOHOE	DEMPSEY	1	4/21/96	13:09		1	2453919	2458379	4	39	34	5	4		5		82	87	48.6	35.75	NO	35.75	3110.25			0.411	5
30203		E	880	1	DEMPSEY	ANDON	1	4/28/96	13:13	3645A	1	2004290	2004842	0	15	9	1	2		5		31	32	5.52	13.75	NO	13.75	440.00			0.430	6
30207		E	880	1	DEMPSEY	ANDON	1	5/19/96	13:51	3676A	1	3484803	3486114	0	25	15	4	3		8			55	13.11	23.25	YES	23.25	1278.75	13.11	23.25	0.423	7
30204		E	880	1	DONOHOE	SASSO	1	4/28/96	15:01	3643A	1	2917460	2919882	5	38	41	7	0		9		88	95	29.22	33.7	YES	33.70	3201.50	29.22	33.7	0.355	8
30211		E	880	1	DOOLAN	DONOHOE	1	5/12/96	15:42	3650B	1	1403419	1405849	1	51	28	2	1		14		69	96	25.3	44.15	YES	44.15	4238.40	25.3	44.15	0.460	9
30200		E	880	1	DEMPSEY	DONOHOE	1	4/21/96	16:18	3656A	1	3720742	3720772	0	16	13	2	3		4		36	38	0.3	15.2	NO	15.20	577.60			0.400	10
30209		E	880	1	DONOHOE	DOOLAN	1	5/19/96	17:01	3669A	1	2187382	2187952	3	36	22	0	1		16		49	75	8.7	31	NO	31.00	2325.00			0.413	11
30202		E	880	1	BARRETT	DOOLAN	1	4/28/96	17:07	3662A	1	2730702	2731992	1	22	13	1	0		7		25	43	13.9	18.9	YES	18.90	812.70	13.9	18.9	0.440	12
30201		E	880	1	DEMPSEY	ANDON	1	4/28/96	17:47	3610B	1	3010331	3011836	5	31	22	0	0		7		61	60	20.05	26.35	YES	26.35	1581.00	20.05	26.35	0.439	13
30199		E	880	1	ANDON	DEMPSEY	1	4/28/96	18:34	3693A	1	0	0	0	15	22	1	0		3		35	41	n/a	12.95	NO	12.95	530.95			0.316	14
30212		E	880	1	DEMPSEY	ANDON	1	5/19/96	19:07	3686B	1	381461	382501	1	22	12	0	2		14		47	50	11.4	19.5	YES	19.50	975.00	11.4	19.5	0.390	15
30205		E	880	1	BARRETT	ANDON	1	4/21/96	20:40	3693A	1	2465024	2466395	3	13	8	3	0		4		23	28	16.71	11.65	NO	11.65	326.20			0.416	16
30287		E	880	1	DEMPSEY	DONOHOE	7	4/20/96	5:45	3692A	1	3881619	3882014	0	7	8	2	0				19	17	3.95	6.35	YES	6.35	107.95	3.95	6.35	0.374	17
30292		E	880	1	SASSO	BARRETT	7	5/11/96	6:26	3606B	1	1969452	1969992	0	8		1	0				19	9	5.4	7	YES	7.00	63.00	5.4	7	0.778	18
30291		E	880	1	ANDON	DEMPSEY	7	5/18/96	6:35	3686A	1	1688940	1689265	1	4	10	2	0				17	16	4.25	3.8	NO	3.80	60.80			0.238	19
30295		E	880	1	ANDON	DONOHOE	7	5/11/96	7:55	3667A	1	3093413	3093413	0	17	19	1	0		1		28	36	0	14.65	NO	14.65	556.70			0.386	20
30288		E	880	1	DONOHOE	DOOLAN	7	5/18/96	8:15	3635B	1	2407118	2408444	2	37	20	2	0		2		56	61	15.26	31.85	NO	31.85	1942.85			0.522	21
30290		E	880	1	DEMPSEY	DOOLAN	7	5/11/96	9:25	3644B	1	2824688	2827588	1	57	48	7	1		2		55	115	30	50.25	YES	50.25	5778.75	30	50.25	0.437	22
30286		E	880	1	DEMPSEY	ANDON	7	5/18/96	10:10	3659B	1	944011	946631	2	48	28	5	5				84	86	28.2	43.8	YES	43.80	3766.80	28.2	43.8	0.509	23
30289		E	880	1	DONOHOE	DOOLAN	7	5/18/96	10:38	3621B	1	2275605	2277717	2	63	26	6	3		4		58	102	23.12	55.95	NO	55.95	5706.90			0.549	24
30285		E	880	1	BARRETT	SASSO	7	5/18/96	20:38	3676A	1	3471300	3472093	3	16	12	0	0				20	28	10.93	13.6	YES	13.60	380.80	10.93	13.6	0.486	25
30294		E	880	1	SASSO	ANDON	7	5/20/96	22:37	3669A	1	1767319	1767814	0	12	10	1	0		4		25	27	4.95	10.4	NO	10.40	280.80			0.385	26
														Sum	700	469	60	30	0	117	0	Mean	52.9				23.81	0.450	17.65	26.26	0.455	
														%	0.509	0.341	0.044	0.022	0.000	0.085	0.000	STDEV	29.5				14.107	398.053	32.8 %		0.113	
														1376								COV	0.56				0.59	0.118			0.25	
																						Tolerance	22.2				23.8	0.95			9.9	

Table B-5.3
Trip Sample Records: Weekday Surface Green Line - E Outbound

Rec. No.	Probl. Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30678	E	880	0	DEMPSEY	ANDON	4	4/24/96	5:01	3649B	1									3		3		1
30670	E	880	0	DONOHOE	DEMPSEY	4	5/22/96	5:25	3652A	1									7		1		2
30707	E	880	0	SASSO	ANDON	6	5/10/96	5:35	3690A	1									4		8		3
30673	E	880	0	BARRETT	ANDON	4	5/22/96	5:37	3619A	1									5		2		4
30702	E	880	0	BARRETT	DOOLAN	6	4/19/96	5:45	3665B	1									6		26		5
																		Sum	25				
																		Mean	5.0				
																		STDEV	1.6				
																		COV	0.32				
																		Tolerance	31.1 %				
30656	E	880	0	DONOHOE	DOOLAN	3	5/21/96	6:00	3690B	2									10		43		1
30689	E	880	0	DEMPSEY	ANDON	5	5/16/96	6:00	3670B	1									1		27		2
30706	E	880	0	BARRETT	DEMPSEY	6	5/31/96	6:00	3654A	1									3		35		3
30699	E	880	0	ANDON	DEMPSEY	7	5/18/96	6:04	3686A	1									3		7		4
30664	E	880	0	DEMPSEY	BARRETT	3	5/29/96	6:06	3600A	1									2		35		5
30708	E	880	0	DOOLAN	BARRETT	6	5/10/96	6:43	3681B	1									9		56		6
30704	E	880	0	ANDON	DONOHOE	6	5/31/96	6:58	3665A	2									0		13		7
30701	E	880	0	SASSO	ANDON	6	4/19/96	7:09		2									0		15		8
30669	E	880	0	DONOHOE	DEMPSEY	4	5/22/96	7:12	3611A	1									3		78		9
30687	E	880	0	DEMPSEY	DONOHOE	5	5/9/96	7:57	3686B	2									4		54		10
30691	E	880	0	DOOLAN	BARRETT	5	5/16/96	8:13	3654B	1									7		53		11
30679	E	880	0	DONOHOE	SASSO	4	4/24/96	8:45	3622A	1									18		80		12
																		Sum	60				
																		Mean	5.0				
																		STDEV	5.2				
																		COV	1.05				
																		Tolerance	66.6 %				

Table B-5.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - E Outbound

Rec. No.	Probl. Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30688	E	880	0	DONOHOE	ANDON	5	5/30/96	9:36	3636B	2									2		40	1
30676	E	880	0	DONOHOE	ANDON	4	5/29/96	9:54	3695A	1									8		37	2
30697	E	880	0	DONOHOE	DEMPSEY	6	5/10/96	9:56	3662B	1									7		51	3
30703	E	880	0	ANDON	DONOHOE	6	5/31/96	9:56	3674A	2									3		34	4
30665	E	880	0	BARRETT	DOOLAN	4	4/24/96	10:13	3642A	1									3		34	5
30692	E	880	0	SASSO	BARRETT	5	5/16/96	10:30	3613A	1									8		69	6
30694	E	880	0	DEMPSEY	BARRETT	5	5/30/96	10:55	3629A	1									7		31	7
30705	E	880	0	DEMPSEY	RECORDER	6	5/31/96	10:56	3665A	2									5		33	8
30675	E	880	0	DONOHOE	SASSO	4	4/24/96	11:07	3604A	1									7		68	9
30700	E	880	0	BARRETT	DOOLAN	6	4/19/96	11:07	3610A	1									4		24	10
30693	E	880	0	ANDON	DONOHOE	5	5/30/96	11:24	3674B	1									9		69	11
30686	E	880	0	DOOLAN	ANDON	5	5/9/96	11:31	3690A	1									9		28	12
30663	E	880	0	BARRETT	SASSO	4	5/15/96	11:42	3616A	2									6		28	13
30672	E	880	0	DOOLAN	SASSO	4	5/22/96	12:19	3637A	1									29		74	14
30690	E	880	0	ANDON	DEMPSEY	5	5/16/96	12:20	3684B	1									15		77	15
30674	E	880	0	BARRETT	DOOLAN	4	4/24/96	12:24	3632A	2									4		55	16
30681	E	880	0	DONOHOE	DOOLAN	4	5/8/96	12:40	3680B	2									4		15	17
30651	E	880	0	BARRETT	SASSO	3	5/21/96	12:53	3644B	1									8		34	18
30695	E	880	0	DEMPSEY	DONOHOE	5	5/9/96	12:56	3654B	2									20		53	19
30680	E	880	0	DEMPSEY	ANDON	4	5/8/96	13:01	3635A	1									9		37	20
30655	E	880	0	DEMPSEY	ANDON	3	5/28/96	13:10	3634A	2									3		35	21
30683	E	880	0	BARRETT	SASSO	5	5/9/96	13:20	3667B	1									13		6	22

Sum	183
Mean	8.3
STDEV	6.3
COV	0.76
Tolenrance	35.6 %

30660	E	880	0	DONOHOE	DEMPSEY	3	5/14/96	14:33	3644A	1									3		72	1
30657	E	880	0	DONOHOE	DOOLAN	3	5/21/96	14:40	3603A	2									15		31	2
30666	E	880	0	DONOHOE	DOOLAN	4	5/15/96	14:55	3639A	2									4		29	3
30654	E	880	0	DONOHOE	SASSO	3	5/28/96	15:08	3618B	1									27		32	4
30635	E	880	0	DONOHOE	DOOLAN	2	5/13/96	15:14	3654A	1									9		29	5
30677	E	880	0	DONOHOE	DOOLAN	4	5/8/96	15:50	3645A	1									10		43	6

Sum	68
Mean	11.3
STDEV	8.8
COV	0.78
Tolenrance	69.9 %

Table B-5.3 (cont.)
Trip Sample Records: Weekday Surface Green Line - E Outbound

Rec. No.	Probl. Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30662	E	880	0	BARRETT	SASSO	4	5/15/96	16:01	3670B	2									14		77	1
30667	E	880	0	DEMPSEY	ANDON	4	5/15/96	16:34	3604B	2									10		43	2
30659	E	880	0	DONOHOE	DEMPSEY	3	5/14/96	16:42	3635B	2									3		34	3
30684	E	880	0	BARRETT	SASSO	5	5/9/96	16:42	3664A	2									2		18	4
30632	E	880	0	BARRETT	SASSO	2	5/13/96	17:00	3606B	2									10		52	5
30652	E	880	0	DEMPSEY	ANDON	3	5/21/96	17:11	3679B	2									7		57	6
30650	E	880	0	BARRETT	SASSO	3	4/23/96	17:15	3635A	1									17		58	7
30696	E	880	0	DONOHOE	BARRETT	5	4/25/96	17:16	3660A	2									9		56	8
30636	E	880	0	BARRETT	SASSO	2	5/20/96	17:18	3699A	2									29		67	9
30649	E	880	0	DEMPSEY	ANDON	3	4/23/96	17:33	3610B	1									7		47	10
30671	E	880	0	SASSO	DOOLAN	4	5/22/96	17:35	3628B	2									7		92	11
30653	E	880	0	ANDON	DEMPSEY	3	5/28/96	17:45	3699B	2									7		68	12
30644	E	880	0	ANDON	DEMPSEY	3	5/7/96	17:55	3607B	1									17		76	13

Sum	139
Mean	10.7
STDEV	7.2
COV	0.67
Tolenrance	41.0 %

30637	E	880	0	DONOHOE	DOOLAN	2	5/20/96	18:15	3681B	1									15		55	1
30633	E	880	0	DEMPSEY	ANDON	2	5/13/96	18:30	3675A	1									4		46	2
30634	E	880	0	DONOHOE	DOOLAN	2	5/13/96	18:40	3613A	1									27		59	3
30685	E	880	0	BARRETT	SASSO	5	5/9/96	18:50	3607A	1									18		68	4
30661	E	880	0	BARRETT	SASSO	3	5/14/96	18:52	3684B	1									23		81	5
30648	E	880	0	DEMPSEY	ANDON	3	5/28/96	19:04	3674B	2									0		18	6
30647	E	880	0	DEMPSEY	ANDON	3	5/28/96	19:25	3627A	1									2		47	7
30641	E	880	0	SASSO	DOOLAN	2	5/6/96	19:47	3645A	1									5		28	8
30698	E	880	0	BARRETT	SASSO	7	5/18/96	20:20	3676A	1									17		38	9
30640	E	880	0	DEMPSEY	DONOHOE	2	5/6/96	20:59	3664A	1									12		57	10
30645	E	880	0	BARRETT	SASSO	3	5/7/96	21:08	3602A	1									24		27	11
30638	E	880	0	SASSO	DOOLAN	2	4/22/96	21:26	3691B	1									12		40	12
30682	E	880	0	BARRETT	SASSO	4	5/8/96	21:28	3689A	1									18		65	13
30639	E	880	0	BARRETT	ANDON	2	4/22/96	22:34	3656A	1									12		37	14
30646	E	880	0	DOOLAN	DONHOE	3	5/7/96	22:54	3635A	1									2		18	15
30643	E	880	0	DEMPSEY	ANDON	3	5/7/96	22:55	3623B	1									4		15	16
30642	E	880	0	DEMPSEY	DONOHOE	2	5/6/96	22:58	3668B	1									2		17	17

Sum	197
Mean	11.6
STDEV	8.7
COV	0.75
Tolenrance	40.1 %

Table B-5.4
Trip Sample Records: Weekend Surface Green Line -E Outbound

Rec. No.	Rte	No.	Dir.	Obs.	Rec.	Day	Date	Time	Veh. No.	Car	Beg.	End	Bills	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	A_free	N_free	Inb.	Outb.	n
30628	E	880	0	DONOHOE	DOOLAN	1	5/19/96	12:01	3684A	1									7			43	1
30629	E	880	0	DEMPSEY	ANDON	1	5/19/96	12:48	3699B	1									0			57	2
30616	E	880	0	DEMPSEY	ANDON.	1	4/28/96	12:54	3645A	1									1			22	3
30623	E	880	0	DONOHOE	DEMPSEY	1	4/21/96	12:54	3665A	1									1			20	4
30625	E	880	0	DEMPSEY	ANDON	1	5/19/96	13:12	3676A	1									19			44	5
30622	E	880	0	DONOHOE	SASSO	1	4/28/96	14:42	3643A	1									9			73	6
30631	E	880	0	DOOLAN	DONOHOE	1	5/12/96	15:20	3650B	1									12			66	7
30621	E	880	0	DEMPSEY	DONOHOE	1	4/21/96	16:00	3656A	1									15			71	8
30626	E	880	0	DONOHOE	DOOLAN	1	5/19/96	16:42	3669A	1									9			24	9
30620	E	880	0	BARRETT	DOOLAN	1	4/28/96	16:44	3608B	1									12			56	10
30618	E	880	0	DEMPSEY	ANDON	1	4/28/96	17:27	3610B	1									9			16	11
30630	E	880	0	DOOLAN	DONOHOE	1	5/12/96	17:29	3604A	1									5				12
30619	E	880	0	ANDON	DEMPSEY	1	4/28/96	18:10	3662A	1									9			64	13
30617	E	880	0	DEMPSEY	ANDON	1	5/19/96	18:49	3686B	1									5			30	14
30624	E	880	0	BARRETT	ANDON	1	4/21/96	20:14	3693A	1									2			8	15
30627	E	880	0	BARRETT	SASSO	1	5/19/96	22:10	3669A	1									10			18	16
30715	E	880	0	SASSO	BARRETT	7	5/11/96	6:06	3606B	1									2			12	17
30709	E	880	0	DEMPSEY	DONOHOE	7	4/20/96	6:26	3692A	1									5			14	18
30717	E	880	0	ANDON	DONOHOE	7	5/11/96	7:40	3677A	1									22			31	19
30711	E	880	0	DONOHOE	DOOLAN	7	5/18/96	7:54	3635B	1									7			39	20
30714	E	880	0	DEMPSEY	DOOLAN	7	5/11/96	9:05	3644B	1									5			24	21
30713	E	880	0	DEMPSEY	ANDON	7	5/18/96	9:20	3669A	1									3			22	22
30716	E	880	0	DONOHOE	ANDON	7	5/11/96	10:00	3606B	1									2			33	23
30712	E	880	0	DONOHOE	DOOLAN	7	5/18/96	10:16	3621B	1									16			36	24
30710	E	880	0	SASSO	ANDON	7	4/20/96	20:21	3669A	1									6			30	25

Sum	193
Mean	7.7
STDEV	5.8
COV	0.75
Tolenrance	33.0 %

Table B-6
Statistical Calculations for Surface Green Line and the Light Rail System

		Data from Trip Sample Records of Surface Green Line (Tables B-2.1 through B-5 4)													WEEK			WEEKDAY			WEEKEND		
Line	Period	PAX	Rev.	sP	sR	Survey	Av. FB	Correl.	Week	Day	All PAX	All Rev.	Factor	PAX*Fac.	Rev*Fac.	COVpax	COVrev	COVcor	COVpax	COVrev	COVcor	COVpax	COVrev	COVcor
B	early	45.5	14 41	13.77	3.42	4	0.317	0.990	30	6	1365.0	432.38	0.0023	0.10511	0 03330	0 0000002	0.0000003	-0.0000004	0.0000003	0.0000002	-0.0000004			
B	AM	68.5	18.26	43 34	10.19	11	0.267	0 961	355	71	24301.4	6481.98	0.0273	1.87135	0.49915	0 0000856	0.0001175	-0.0001928	0.0001384	0 0000814	-0 0002040			
B	base	65.0	25.7	32.9	13.82	23	0.395	0.956	420	84	27281.7	10785.78	0.0323	2.10086	0.83057	0.0000331	0.0001445	-0.0001322	0.0000534	0.0001000	-0.0001399			
B	school	60 4	26.8	20 4	11 81	11	0 444	0.916	180	36	10865.5	4819.91	0.0139	0.83671	0.37116	0.0000049	0.0000405	-0.0000258	0.0000079	0.0000281	-0 0000273			
B	PM	39.8	12.99	19 56	10.09	5	0.326	0.900	240	48	9552.0	3117.60	0 0185	0.73556	0.24007	0 0000175	0.0001157	-0.0000811	0.0000284	0.0000801	-0.0000858			
B	evening	51.9	22.97	25.26	9 86	11	0 443	0.000	345	69	17908.6	7925.59	0.0266	1.37907	0.61032	0.0000275	0.0001038	0.0000000	0.0000444	0.0000718	-0.0000969			
B	weekend	69.9	28 71	35 92	16.44	21	0 411	0.932	385	385	26913 3	11053.17	0.0296	2.07249	0.85116	0.0000362	0.0001883	-0.0001540				0.0007944	0.0011550	-0.0017863
B	early	10.7		4.9329		3	0.000		15	3	160.0	0.00	0.0012	0 01232	0.00000	0.0000000	0.0000000	0 0000000	0.0000000	0.0000000	0 0000000			
B	AM	18.7		13.402		14	0.000		270	54	5052.9	0.00	0.0208	0.38910	0 00000	0.0000037	0.0000000	0 0000000	0.0000060	0.0000000	0 0000000			
B	base	31.2		18.625		26	0.000		470	94	14660.4	0.00	0.0362	1.12894	0.00000	0.0000117	0.0000000	0 0000000	0.0000190	0.0000000	0 0000000			
B	school	29.7		13 382		6	0.000		150	30	4450 0	0 00	0.0116	0.34268	0.00000	0.0000027	0.0000000	0 0000000	0.0000043	0 0000000	0.0000000			
B	PM	61.5		14.694		6	0.000		230	46	14145.0	0.00	0.0177	1.08925	0 00000	0.0000076	0.0000000	0.0000000	0.0000122	0.0000000	0.0000000			
B	evening	42.7		20.602		10	0.000		435	87	18574.5	0.00	0.0335	1.43035	0 00000	0.0000320	0.0000000	0.0000000	0.0000517	0.0000000	0.0000000			
B	weekend	38.8		33.546		21	0.264		385	385	14941.7	0.00	0 0296	1.15060	0.00000	0.0000316	0.0000000	0.0000000				0.0006930	0.0000000	0.0000000
C	early	14.5	2.53	3 54	0.32	2	0.174	1.000	30	6	435.0	75.75	0.0023	0.03350	0.00583	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
C	AM	70.0	14.27	50.20	9.81	16	0.204	0.973	260	52	18200.0	3710.69	0.0200	1.40151	0.28575	0.0000424	0.0000401	-0.0000803	0 0000685	0.0000278	-0 0000849			
C	base	60.9	24.26	32.25	13.11	26	0 398	0.977	255	51	15525.6	6185.71	0.0196	1.19556	0.47634	0.0000104	0.0000424	-0 0000409	0.0000167	0.0000294	-0.0000433			
C	school	35.6	14.81	27.06	10.77	10	0.416	0.983	190	38	6764.0	2813.90	0.0146	0.52087	0.21669	0 0000105	0.0000413	-0 0000410	0.0000170	0.0000286	-0.0000434			
C	PM	25.5	10.56	11.76	6.28	15	0.414	0.923	190	38	4851.3	2006.40	0.0146	0.37358	0.15450	0.0000013	0.0000094	-0.0000065	0 0000021	0.0000065	-0 0000069			
C	evening	29.5	10.63	18.57	7.25	23	0.360	0.943	240	48	7085.2	2550.26	0.0185	0.54560	0.19639	0.0000034	0 0000130	-0.0000126	0.0000056	0.0000090	-0 0000133			
C	weekend	42.9	16.73	22.00	9.28	28	0.390	0.945	307	307	13168.1	5137.32	0.0236	1.01402	0.39560	0.0000065	0.0000286	-0.0000257				0.0001422	0.0001754	-0.0002984
C	early	0.0	-	0		1	0.000		15	3	0.0	0 00	0 0012	0.00000	0.00000	0.0000000	0.0000000	0.0000000	0 0000000	0.0000000	0 0000000			
C	AM	6.9		5.201		16	0.000		205	41	1409.4	0.00	0.0158	0.10853	0.00000	0.0000003	0.0000000	0.0000000	0.0000005	0.0000000	0.0000000			
C	base	14.7		7.5476		28	0.000		295	59	4330.2	0.00	0.0227	0.33345	0.00000	0.0000007	0.0000000	0.0000000	0.0000011	0 0000000	0.0000000			
C	school	21.3		11.979		15	0.000		160	32	3402.7	0.00	0.0123	0.26203	0.00000	0.0000010	0.0000000	0 0000000	0.0000016	0.0000000	0 0000000			
C	PM	15 5		7.2676		12	0.000		180	36	2790.0	0.00	0.0139	0.21485	0.00000	0.0000006	0.0000000	0.0000000	0.0000009	0.0000000	0.0000000			
C	evening	15.4		50.406		26	0 000		310	62	4769 2	0.00	0.0239	0.36726	0.00000	0.0000374	0.0000000	0.0000000	0.0000604	0.0000000	0.0000000			
C	weekend	20.8		16.818		26	0.263		307	307	6399.8	0 00	0.0236	0.49282	0 00000	0.0000041	0.0000000	0.0000000				0.0000895	0.0000000	0.0000000
D	early	17.7	0.45	6.51	1.67	3	0.025	0.751	35	7	618.3	15.58	0.0027	0.04762	0.00120	0.0000001	0.0000001	-0.0000001	0.0000001	0.0000001	-0 0000001			
D	AM	75.1	0.48	37.85	27 82	14	0.006	0.861	340	68	25524.3	163.59	0.0262	1.96552	0.01260	0.0000471	0.0006305	-0.0002964	0 0000761	0.0004366	-0.0003137			
D	base	58.6	0.79	20.85	14.87	21	0.013	0.793	300	60	17571.4	237.15	0.0231	1.35311	0.01826	0.0000074	0.0000935	-0.0000418	0.0000120	0.0000648	-0.0000442			
D	school	40.1	0.62	16.50	13.95	8	0 016	0.927	210	42	8426.3	131.04	0.0162	0.64887	0.01009	0.0000060	0.0001059	-0 0000466	0.0000097	0 0000734	-0.0000493			
D	PM	44.6	0.66	17.98	15.94	14	0.015	0.683	250	50	11142.9	163.90	0.0193	0.85807	0.01262	0.0000057	0 0001120	-0.0000346	0.0000093	0 0000776	-0.0000366			
D	evening	41 5	0.76	17.91	17.82	11	0.018	0.936	215	43	8912.7	163.61	0.0166	0 68633	0.01260	0.0000054	0 0001316	-0.0000498	0.0000087	0.0000912	-0.0000526			
D	weekend	58 2	0.89	25.71	28.26	26	0.015	0.951	316	316	18376 6	280 55	0.0243	1 41511	0 02160	0.0000101	0.0003028	-0.0001052				0.0002214	0.0018569	-0.0012196
D	early	27.0		19.799		2	0.000		15	3	405.0	0 00	0.0012	0 03119	0 00000	0.0000002	0.0000000	0.0000000	0.0000003	0.0000000	0.0000000			
D	AM	21.8		14.196		16	0.000		260	52	5655.0	0 00	0.0200	0.43547	0 00000	0.0000034	0.0000000	0.0000000	0.0000055	0.0000000	0.0000000			
D	base	21.3		14.767		16	0 000		350	70	7437.5	0.00	0.0270	0.57273	0.00000	0.0000066	0.0000000	0.0000000	0.0000107	0.0000000	0.0000000			
D	school	33.5		24.159		11	0.000		180	36	6038.2	0.00	0.0139	0.46498	0.00000	0.0000068	0.0000000	0.0000000	0.0000111	0.0000000	0.0000000			
D	PM	29.3		22.858		8	0.000		240	48	7020.0	0.00	0.0185	0.54058	0.00000	0.0000150	0.0000000	0.0000000	0.0000242	0.0000000	0.0000000			
D	evening	17.1		15.474		16	0.000		305	61	5223.1	0.00	0.0235	0.40221	0.00000	0.0000055	0.0000000	0.0000000	0.0000090	0.0000000	0.0000000			
D	weekend	20.6		18.83		26	0.011		316	316	6514.5	0.00	0 0243	0.50165	0.00000	0.0000054	0.0000000	0.0000000				0.0001188	0.0000000	0.0000000
E	early	21.8	5.35	8.54	2.86	4	0.246	0.992	15	3	326.3	80.25	0 0012	0.02512	0.00618	0.0000000	0.0000000	-0.0000001	0.0000000	0.0000000	-0.0000001			
E	AM	54 7	17.73	24.61	9.53	11	0.324	0.903	175	35	9577.3	3102.27	0 0135	0 73751	0.23889	0.0000067	0.0000249	-0.0000234	0.0000108	0.0000173	-0.0000247			
E	base	58.2	26.02	27.27	12.35	24	0.447	0 971	350	70	20372.9	9107.29	0.0270	1.56884	0.70132	0.0000151	0.0000768	-0.0000662	0.0000244	0.0000532	-0.0000700			
E	school	85.0	36.67	11.36	3.34	5	0.431	0.650	130	26	11050.0	4767.10	0.0100	0.85092	0.36710	0.0000017	0.0000037	-0.0000033	0.0000028	0.0000026	-0.0000035			
E	PM	60.1	14.23	30.69	8.98	12	0.237	0.751	140	28	8411.7	1992.17	0.0108	0.64775	0.15341	0.0000061	0.0000130	-0.0000134	0.0000099	0.0000090	-0.0000142			
E	evening	54.1	21.30	31.09	13.20	18	0.394	0.913	245	49	13243.6	5218.50	0.0189	1.01984	0.40186	0.0000128	0.0000574	-0.0000495	0.0000207	0.0000397	-0.0000524			
E	weekend	52.9	23.81	29.55	14.11	26	0.450	0.955	342	342	18099.7	8142.23	0.0263	1.39379	0 62700	0.0000156	0.0000884	-0.0000710				0.0003426	0.0005418	-0.0008230
E	early	5.0		1 5811		5	0.000		30	6	150.0	0.00	0.0023	0.01155	0.00000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000			
E	AM	5.0		5 2397		12	0 000		210	42	1050.0	0.00	0.0162	0.08086	0.00000	0.0000004	0.0000000	0.0000000	0.0000006	0.0000000	0 0000000			
E	base	8.3		6.3048		22	0.000		340	68	2828.2	0.00	0.0262	0.21779	0.00000	0.0000008	0.0000000	0.0000000	0.0000013	0.0000000	0.0000000			
E	school	11.3		8.8242		6	0.000		140	28	1586.7	0.00	0.0108	0.12218	0.00000	0.0000010	0.0000000	0.0000000	0.0000016	0.0000000	0.0000000			
E	PM	10 7		7.1808		13	0.000		140	28	1496.9	0.00	0.0108	0.11527	0.00000	0.0000003	0.0000000	0.0000000	0.0000005	0.0000000	0.0000000			
E	evening	11 6		8.711		17	0.000		200	40	2317.6	0.00	0.0154	0.17847	0.00000	0.0000007	0.0000000	0.0000000	0.0000011	0.0000000	0.0000000			
E	weekend	7.7		5 7917		25	0.393		343	343	2648.0	0.00	0 0264	0.20391	0.00000	0.0000006	0 0000000	0.0000000				0.0000138	0.0000000	0.0000000
	Avg. FB sub. GL:	*ALL*	0.532939	*Avg. FB surf. GL:*		*ALL*	0.200790	*SUM*	12986	1855	501327	100662	*Av. PAX=*	38.6	7.752	0.000599	0.002526	-0 001595	0.000791	0.001328	-0.001408	0.002416	0.003729	-0 004127
	Factor=	*WK*	0.550865	*Factor=*		*WK*	0.192886		10285	2057	394265	76048		38.3				0.0015			0 0007			0.0020
	0.43045	*WE*	0.461232	*0.56855*		*WE*	0.229898		2701	2701	107062	24613		39.6			*Tolerance:*	0.0767			0 0523			0.0880
		Avg. FB LR System		*ALL*	0.343762																			
				WK	0.346977																			
				WE	0.329475																			

Table B-6 (cont.)
Statistical Calculations for Surface Green Line and the Light Rail System

Line	Period	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	free	Multi	total	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	free	Multi	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	free	Multi	SUM
B	early	65	106	8	2	0	1		182	0.357	0.582	0.044	0.011	0.000	0.005	0.000	487.50	795.00	60.00	15.00	0.00	7.50	0.00	1365.00
B	AM	225	478.0	20.0	14	12	4		753	0.299	0.635	0.027	0.019	0.016	0.005	0.000	7261.36	15426.36	645.45	451.82	387.27	129.09	0.00	24301.36
B	base	665	645	109	9	56	10		1494	0.445	0.432	0.073	0.006	0.037	0.007	0.000	12143.48	11778.26	1990.43	164.35	1022.61	182.61	0.00	27281.74
B	school	335	245	35	7	34	8		664	0.505	0.369	0.053	0.011	0.051	0.012	0.000	5481.82	4009.09	572.73	114.55	556.36	130.91	0.00	10865.45
B	PM	75	110	4	1	7	2		199	0.377	0.553	0.020	0.005	0.035	0.010	0.000	3600.00	5280.00	192.00	48.00	336.00	96.00	0.00	9552.00
B	evening	286	231	48	0	2	4		571	0.501	0.405	0.084	0.000	0.004	0.007	0.000	8970.00	7245.00	1505.45	0.00	62.73	125.45	0.00	17908.64
B	weekend	694	641	49	8	0	76		1468	0.473	0.437	0.033	0.005	0.000	0.052	0.000	12723.33	11751.67	898.33	146.67	0.00	1393.33	0.00	26913.33
B	early																					160.00		160.00
B	AM																					5052.86		5052.86
B	base																					14660.38		14660.38
B	school																					4450.00		4450.00
B	PM																					14145.00		14145.00
B	evening																					18574.50		18574.50
B	weekend																					14941.67		14941.67
C	early	5	20	4	0	0	0		29	0.172	0.690	0.138	0.000	0.000	0.000	0.000	75.00	300.00	60.00	0.00	0.00	0.00	0.00	435.00
C	AM	259	800	33	4	4	20		1120	0.231	0.714	0.029	0.004	0.004	0.018	0.000	4208.75	13000.00	536.25	65.00	65.00	325.00	0.00	18200.00
C	base	678	597	244	14	33	17		1583	0.428	0.377	0.154	0.009	0.021	0.011	0.000	6649.62	5855.19	2393.08	137.31	323.65	166.73	0.00	15525.58
C	school	158	126	39	15	11	7		356	0.444	0.354	0.110	0.042	0.031	0.020	0.000	3002.00	2394.00	741.00	285.00	209.00	133.00	0.00	6764.00
C	PM	160	166	27	0	2	8		383	0.470	0.433	0.070	0.000	0.005	0.021	0.000	2280.00	2102.67	342.00	0.00	25.33	101.33	0.00	4851.33
C	evening	280	350	24	4	0	21		679	0.412	0.515	0.035	0.006	0.000	0.031	0.000	2921.74	3652.17	250.43	41.74	0.00	219.13	0.00	7085.22
C	weekend	527	486	87	8	0	93		1201	0.439	0.405	0.072	0.007	0.000	0.077	0.000	5778.18	5328.64	953.89	87.71	0.00	1019.68	0.00	13168.11
C	early																					0.00		0.00
C	AM																					1409.38		1409.38
C	base																					4330.18		4330.18
C	school																					3402.67		3402.67
C	PM																					2790.00		2790.00
C	evening																					4769.23		4769.23
C	weekend																					6399.77		6399.77
D	early	15	33	3	0	0	2	0	53	0.283	0.623	0.057	0.000	0.000	0.038	0.000	175.00	385.00	35.00	0.00	0.00	23.33	0.00	618.33
D	AM	312	640	31	20	14	15	19	1051	0.297	0.609	0.029	0.019	0.013	0.014	0.018	7577.14	15542.86	752.86	485.71	340.00	364.29	461.43	25524.29
D	base	610	435	114	38	7	18	8	1230	0.496	0.354	0.093	0.031	0.006	0.015	0.007	8714.29	6214.29	1628.57	542.86	100.00	257.14	114.29	17571.43
D	school	119	120	19	26	24	10	3	321	0.371	0.374	0.059	0.081	0.075	0.031	0.009	3123.75	3150.00	498.75	682.50	630.00	262.50	78.75	8426.25
D	PM	255	287	33	13	13	15	8	624	0.409	0.460	0.053	0.021	0.021	0.024	0.013	4553.57	5125.00	589.29	232.14	232.14	267.86	142.86	11142.86
D	evening	210	215	20	1	2	3	5	456	0.461	0.471	0.044	0.002	0.004	0.007	0.011	4104.55	4202.27	390.91	19.55	39.09	58.64	97.73	8912.73
D	weekend	855	480	77	20	8	60	12	1512	0.565	0.317	0.051	0.013	0.005	0.040	0.008	10391.54	5833.85	935.85	243.08	97.23	729.23	145.85	18376.62
D	early																					405.00		405.00
D	AM																					5655.00		5655.00
D	base																					7437.50		7437.50
D	school																					6038.18		6038.18
D	PM																					7020.00		7020.00
D	evening																					5223.13		5223.13
D	weekend																					6514.46		6514.46
E	early	24	54	5	0	0	4		87	0.276	0.621	0.057	0.000	0.000	0.046	0.000	90.00	202.50	18.75	0.00	0.00	15.00	0.00	326.25
E	AM	224	338	15	4	14	7		602	0.372	0.561	0.025	0.007	0.023	0.012	0.000	3563.64	5377.27	238.64	63.64	222.73	111.36	0.00	9577.27
E	base	694	514	107	33	22	27		1397	0.497	0.368	0.077	0.024	0.016	0.019	0.000	10120.83	7495.83	1560.42	481.25	320.83	393.75	0.00	20372.92
E	school	207	154	27	5	25	7		425	0.487	0.362	0.064	0.012	0.059	0.016	0.000	5382.00	4004.00	702.00	130.00	650.00	182.00	0.00	11050.00
E	PM	294	366	21	9	17	14		721	0.408	0.508	0.029	0.012	0.024	0.019	0.000	3430.00	4270.00	245.00	105.00	198.33	163.33	0.00	8411.67
E	evening	444	462	26	2	3	36		973	0.456	0.475	0.027	0.002	0.003	0.037	0.000	6043.33	6288.33	353.89	27.22	40.83	490.00	0.00	13243.61
E	weekend	700	469	60	30	0	117		1376	0.509	0.341	0.044	0.022	0.000	0.085	0.000	9207.69	6169.15	789.23	394.62	0.00	1539.00	0.00	18099.69
E	early																					150		150.00
E	AM																					1050		1050.00
E	base																					2828.18		2828.18
E	school																					1587		1586.67
E	PM																					1497		1496.92
E	evening																					2318		2317.65
E	weekend																					2648		2647.96
	SUM	9395	9568	1289	287	310	606	55	21510	0.437	0.445	0.060	0.013	0.014	0.028	0.003	152060.11	163178.41	19880.20	4964.70	5859.15	154343.48	1040.89	501326.94
																	28893.05	22914.16	2788.07	477.46	97.23	33646.10	145.85	88961.91
																	123167.06	140264.26	17092.13	4487.24	5761.92	120697.38	895.05	412365.03

sub. GL:	*total*	0.6206	0.3349	0.0197	0.0090	0.0032	0.0126	
Factor=	*WE*	0.5314	0.4025	0.0209	0.0170	0.0003	0.0278	
0.4304451	*WD*	0.6407	0.3196	0.0194	0.0072	0.0038	0.0092	
LR System:	*total*	0.4399	0.32954	0.0311	0.00952	0.0080	0.1808	0.0012
	WE	0.4137	0.3200	0.0269	0.01038	0.0008	0.22738	0.0009
	WD	0.4459	0.3313	0.0320	0.0093	0.0096	0.1707	0.0012

surf. GL:	*total*	0.3033	0.3255	0.0397	0.0099	0.0117	0.3079	0.0021
Factor=	*WE*	0.3248	0.2576	0.0313	0.0054	0.0011	0.3782	0.0016
0.56955	*week*	0.2987	0.3401	0.041449	0.0109	0.0140	0.2927	0.0022

Table B-7
Trip Sample Records and Statistical Calculations: Bus and Trackless Trolley

Rec No	Route	Dir.	Garage	Bus #	Day	Date	Surveyor	SchTime	AcTime	Rem.	CashBeg.	CashEnd	Bill	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	Transf.	Short	A_free	N_free	Fare Box	FB Est	FB OK	PAX	Used FB	Cor.	Calc. of Fare Evation		Av FB #	OK	
10201	9	0	C	8882	1	6/16/96	T PINAKAS	11:00	11:00	0	5522.6	5526.7	0	12	19	3	0			0			4.1	7.65	NO	34	7.37	250.5			0.217	1	1
10197	16	0	D	8885	1	7/7/96	T PINAKAS	20:40	20:40	0	18834.2	18839.8	0	9	13	1	1			0			5.6	5.85	YES	24	5 60	134 4	5.6	5.85	0.233	2	2
10196	16.3	0	D	8662	1	6/16/96	T PINAKAS	9:20	9:20	0	6588.9	6513.6	1	18	21	2	1			0			-74.3	11.4	NO	42	10 98	461 2			0.261	3	2
11211	28	0	B	201	1	8/18/96	LEO SULLIVAN	11:23	11:23	0	6299.34	6309.15	0	5	19	6	1			9	3		9 81	6.9	NO	43	6.65	285 8			0 155	4	2
10208	28	1	B	8775	1	7/7/96	T PINAKAS	14:10	14.10	0	26638.2	26644.3	0	16	18	1	2			0			6.1	10.35	NO	37	9 97	368 9			0 269	5	2
10198	28	0	B	8775	1	7/7/96	T PINAKAS	14:40	14:40	0	26644.3	26648.7	12	0	21	2	1			0	1		16.4	0.6	NO	25	0.58	14.4			0.023	6	2
10205	39.3	1	B	8885	1	7/7/96	T PINAKAS	21.20	21:20	0	18839.8	18844.7	0	8	18	1	0	1		0			4.9	4.95	YES	28	4.90	137.2	4.9	4.95	0 175	7	3
10200	72	0	N	8225	1	6/16/96	T PINAKAS	13.25	13.25	0	6445.3	6450.1	0	12	18	2	0			0			4.8	7 5	NO	32	7.22	231 2			0 226	8	3
10206	72 1	1	N	8228	1	7/7/96	T PINAKAS	19:10	19:10	0	11234.7	11240.3	0	9	12	1	2			0			5.6	6.15	YES	24	5.60	134.4	5.6	6 15	0.233	9	4
10207	88	1	S	268	1	7/7/96	T PINAKAS	18:12	18:12	0	17233.7	17239.8	0	12	18	1	3			0			6.1	8.25	NO	34	7.95	270.2			0 234	10	4
10203	100	1	F	8833	1	6/16/96	T PINAKAS	6:33	6:33	0	9811.2	9814 4	0	8	15	2	0			0			3.2	5.1	NO	25	4 91	122 8			0.196	11	4
10202	101	1	F	375	1	6/16/96	T PINAKAS	5.50	5:50	0	3994.3	3997.1	0	7	12	2	1			0			2.8	4.8	NO	22	4.62	101 7			0.210	12	4
10204	135	1	F	8003	1	6/16/96	T PINAKAS	7:05	7:07	0	12112.4	12116.6	0	11	18	0	1	1		0			4.2	9.15	NO	31	8 81	273.2			0.284	13	4
10199	239	0	Q	8226	1	7/7/96	T PINAKAS	12:30	12:30	0	17992.3	17995.6	11	0	19	1	2			0			14.3	0.75	NO	22	0.72	15.9			0.033	14	4
10147	1	1	D	324	3	6/11/96	PAUL LYONS	10:48	10:48	0	20336 13	20344.1	0	24	12	3	0	24	4	1	3	1	8	15.15	NO	72	14.59	1050.7			0.203	15	4
10004	1	0	D	138	4	6/12/96	T WILKINS	16:37	16:43	0	0	16248.3	1	17	14	2	1	1		3	3		16249.3	11.7	NO	41	11.27	462.0			0.275	16	4
10130	1	1	D		5	6/13/96	KEN TERRELL	15:57	16:01	0	964 77	990.38	0	42	37	2	0	1		1	4		25.61	25.8	YES	87	25.61	2228.1	25.61	25.8	0.294	17	5
10150	1	1	D	285	6	6/7/96	PAUL LYONS	5:10	5:10	0	425.95	428.89	0	5	6	0	0			0			2.94	3	YES	11	2.94	32.3	2.94	3	0.267	18	6
10120	1	1	D	297	6	6/14/96	T WILKINS	21:35	21:35	0	31850.05	31868.2	1	31	13	0	0			5	2		19.13	20.1	YES	51	19.13	975.6	19.13	20.1	0.375	19	7
10085	1	0	D	324	6	6/7/96	PAUL LYONS	6:10	6:10	0	19787.19	19788.4	0	3	26	0	0			0			1.23	1.8	NO	29	1.73	50.3			0.060	20	7
10052	1	0	D	297	6	6/14/96	T WILKINS	22:07	22:12	0	31868.18	31898.5	2	50	11	0	0			3			32.29	30.9	YES	64	32.29	2066.6	32.29	30.9	0.505	21	8
10115	7.1	1	D	8709	5	5/30/96	KEN TERRELL	8:40	8:40	0	5144.03	5169.55	0	24	19	0	0			0	1		25.52	14 4	NO	44	13.87	610.3			0.315	22	8
10156	7.1	1	D	8220	6	6/21/96	T PINAKAS	16:45	16:45	0	8662.4	8677.5	0	18	27	2	0	3		0			15.1	11.1	NO	50	10.69	534.6			0.214	23	8
10121	7.2	1	D	307	6	6/14/96	T WILKINS	20:25	20:30	0	53729.1	53730 7	0	2	4	0	0			0			1.6	1.2	NO	6	1.16	6.9			0.193	24	8
10160	7.3	1	D	304	4	7/10/96	P MACINNES	17:19	17.19	0	1588.52	1591 17	0	4	6	1	0			0			2.65	2.55	YES	11	2.65	29.2	2.65	2.55	0.241	25	9
10069	9	0	D	121	3	6/11/96	TR ENGEL	14:12	14:12	5	85.32	89.13	0	5	5	4	3			0			3.81	4 5	YES	17	3.81	64.8	3.81	4 5	0.224	26	10
10114	9	1	A	8927	5	5/30/96	T WILKINS	14:00	14.00	0	9735.2	9741.35	0	8	8	7	1	8		0		1	6.15	6.15	YES	33	6.15	202.9	6.15	6.15	0.186	27	11
10100	9	0	D	158	5	6/19/96	CURTIS SMITH	21:55	21:55	0	3555.42	3561.42	0	10	7	1	0			1			6	6.45	YES	19	6.00	114.0	6	6.45	0.316	28	12
10138	10	1	S	16	5	5/30/96	P MACINNES	17:15	17:15	0	1975.74	1985.95	0	15	20	6	1			2	1		10.21	10 8	YES	45	10.21	459.5	10 21	10.8	0 227	29	13
10043	10	0	D	281	5	5/30/96	T WILKINS	13:20	13:20	0	20935.1	20940.6	0	7	11	5	0	2		1		1	5.45	5.25	YES	27	5.45	147.2	5.45	5.25	0 202	30	14
10091	10.9	0	D	8703	5	6/20/96	CURTISS SMITH	18.53	18:53	0	22137.95	22145.6	1	12	7	1	0			1	4		8.61	7.65	NO	25	7.37	184.2			0.295	31	14
10068	10 9	0	D		5	6/13/96	KEN TERRELL	17:28	17:28	0	523.06	540.52	1	13	19	7	0			0	5		18.46	8.85	NO	44	8.52	375.1			0.194	32	14
10142	11	1	D	8634	4	5/29/96	CURTIS SMITH	8:26	8:27	0	2025.98	2042.33	0	25	20	7	1			0	3		16.35	16.35	YES	56	16.35	915.6	16.35	16.35	0.292	33	15
10067	11	0	D		5	6/13/96	KEN TERRELL	18:24	18:24	0	3939.28	3942.13	0	3	4	2	2			0	1		2.85	2.7	YES	12	2.85	34.2	2.85	2.7	0.237	34	16
10149	11.3	1	D	8726	4	6/12/96	PAUL LYONS	16:48	16:48	0	6459.15	6465.07	0	6	4	4	3			0			5.92	5.1	NO	17	4.91	83.5			0.289	35	16
10152	15	1	D	125	5	7/11/96	PAUL LYONS	20:30	20:30	0	29721.65	29728.1	0	13	9	2	1			4	21		6.46	9.6	NO	50	9.25	462.3			0.185	36	16
10151	16.5	1	D	154	3	6/11/96	P MACINNES	9:19	9:19	0	2014.41	2028.85	0	19	19	8	0	3		12	2		14.44	16.2	YES	63	14.44	909 7	14.44	16.2	0.229	37	17
10013	17	1	D	320	4	6/5/96	P MACINNES	11.50	11:50	4	0	0	0	2	2	3	1			0			0	1 95	NO	8	1.88	15.0			0.235	38	17
10065	17	0	A	137	5	6/13/96	T WILKINS	19:00	19:00	0	63752.5	63760 7	0	6	8	3	0			7			8.23	6.15	NO	24	5.92	142.2			0.247	39	17
10059	18	0	D	8009	6	6/7/96	T WILKINS	13:00	13:00	0	18973.53	18979.2	0	8	8	6	0	2		0	2		5.7	5.7	YES	26	5.70	148.2	5.7	5.7	0.219	40	18
10035	19	0	D	8724	3	6/6/96	P MACINNES	8:09	8:09	0	11045.93	11048.4	0	3	13	0	3	1		0			2.45	2.7	YES	20	2.45	49.0	2.45	2.7	0 122	41	19
10053	21	0	B	178	3	6/14/96	KEN TERRELL	19:50	19:53	1	25596.03	25605	0	17	21	0	1	1		0	6		8.95	10.5	YES	46	8 95	411.7	8.95	10.5	0 195	42	20
10079	22	0	D	291	4	5/29/96	P MACINNES	13:41	13:41	0	1968.69	1972.42	1	3	3	0	0	5		4	1		4.73	3	NO	16	2.89	46.2			0.181	43	20
10001	23	0	D	8725	3	6/11/96	P MACINNES	7:40	7:40	0	43.19	0	0	5	9	0	0	13		6			-43.19	4.8	NO	33	4 62	152.6			0.140	44	20
10164	23	1	D	155	4	5/29/96	PAUL LYONS	11:20	11:25	0	6442.74	6461.15	0	29	20	3	6	10		12	12		18.41	23 25	NO	92	22.39	2060.3			0.243	45	20
10041	23	0	D	308	5	6/30/96	T WILKINS	16:00	15:59	0	98320 53	98338.6	4	25	26	4	5	5		2	4		22.05	17.7	NO	71	17.05	1210.4			0.240	46	20
10023	23	0	D	127	5	7/11/96	PAUL LYONS	23:33	23:33	0	24736.11	24740 1	0	14	7	0	0			1	1	1	4 02	8 7	NO	24	8.38	201.1			0.349	47	20
10086	23	0	D	103	6	6/7/96	PAUL LYONS	7:35	7:35	0	10076.13	10078	0	1	3	0	2	12		1			1.86	1.5	NO	19	1.44	27.5			0.076	48	20
10111	26	1	B	225	2	6/24/96	TR ENGEL	17:30	17:30	0	58.22	64.52	0	10	12	0	1	4		0	1		6.3	6.3	YES	28	6.30	176.4	6.3	6.3	0.225	49	21
10140	28	1	B	189	3	6/6/96	P MACINNES	9:12	9:12	0	21108.42	21119.7	1	14	11	4	0	3		14	4	1	12.24	13.2	YES	51	12.24	624.2	12.24	13.2	0.240	50	22
10007	28	0	B	198	3	6/11/96	T WILKINS	18:20	18:20	0	0	0	0	6	7	2	2			7	1		0	6.6	NO	25	6.36	158.9			0.254	51	22
10038	28	0	B	8737	4	5/29/96	T WILKINS	16:28	16:28	0	92035.1	92050.4	1	25	15	2	2	6		0	2		16.3	15.9	YES	52	16.30	847.6	16.3	15.9	0 313	52	23
10029	28	0	B	8657	6	7/26/96	L SULLIVAN	7:41	7:50	0	8465.99	8469.04	0	8	13	0	2			7	2	1	3.05	7.5	NO	33	7 22	238.4			0.219	53	23
10080	28.3	0	B	8752	4	6/5/96	P MACINNES	13:45	13:45	0	5562.18	5591.77	0	22	15	7	7	21		8	2		29.59	18.75	NO	82	18.06	1480 9			0 220	54	23
10073	29	0	B	8866	5	6/6/96	T PINAKAS	8:59	8:59	0	7644.3	7649.8	0	18	20	8	4	4		0			5.5	13.2	NO	54	12.71	686.6			0 235	55	23
10166	31	1	B	8757	3	7/16/96	PAUL LYONS	11:15	11:15	0	6936.58	6940.18	0	10	9	0	2			1	2	1	3.6	6 9	NO	25	6.65	166.2			0.266	56	23
10032	31	0	B	235	3	7/16/96	PAUL LYONS	5:30	5:30	0	7771.1	7772.51	0	2	3	0	0			0			1.41	1.2	NO	5	1.16	5.8			0.231	57	23
10031	31	0	B	8752	3	7/16/96	PAUL LYONS	10:56	10:56	0	6936.13	6936.58	0	0	4	1	1			0			0.45	0.45	YES	6	0.45	2.7	0.45	0.45	0.075	58	24
10082	32	0	B	227	3	6/6/96	P MACINNES	5:56	5:56	0	14261	14261.6	1	3	0	0	0			0			1.6	1.8	YES	3	1 60	4.8	1.6	1.8	0.533	59	25
10129	33.6	1	B	185	3	6/11/96	T WILKINS	17:15	17:15	0	13211.3	13214.2	1	3	4	0	4			0	2		3.85	3	NO	13	2.89	37.6			0.222	60	25
10016	34	0	B	228	3	6/4/96	P MACINNES	7:38	7:38	0	18576.37	18576.7	0	1	4	1	4			1	1		0.3	2.25	NO	12	2.17	26.0			0 181	61	25
10028	34.4	0	B	8734	3	7/16/96	PAUL LYONS	8:20	8:20	0	12900.01	12901.8	0	2	2	0	0			0			1.82	1.6	YES	4	1 82	7.3	1.82	1.6	0.455	62	26
10019	34.4	0	B	8734	3	7/16/96	PAUL LYONS	10:00	10:00	0	129972.3	129923	0	2	3	0	0			0			0.6	1.6	NO	5	1.54	7.7			0.308	63	26

Table B-7 (cont.)
Trip Sample Records and Statistical Calculations: Bus and Trackless Trolley

Rec. No	Route	Dir	Garage	Bus #	Day	Date	Surveyor	SchTime	AcTime	Rem.	CashBeg.	CashEnd	Bill	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	Transf	Short	A_free	N_free	Fare Box	FB Est.	FB OK	PAX	Used FB	Cor.	Calc. of Fare Evation		Av. FB	#	OK
10005	34 6	0	B	258	4	6/12/96	T WILKINS	22:10	22 10	0	0	85736.2	0	16	29	1	0			3	1		85736 2	14.25	NO	50	13.73	686.3			0.275	64	26
10058	35.1	0	B	253	5	6/6/96	T WILKINS	15:30	15:32	0	18953 25	18958.1	0	5	8	6	3	3		0	3		4.8	4.8	YES	28	4.80	134.4	4.8	4.8	0.171	65	27
10165	36	1	B	256	3	7/16/96	PAUL LYONS	4:55	4:55	0	26400.13	26401 7	1	2	4	1	0			0			2.57	1.35	NO	7	1.30	9.1			0.186	66	27
10146	36.8	1	B	250	3	6/11/96	PAUL LYONS	15:35	15:35	0	5546.82	5550.85	0	5	3	2	5			0	1	2	4.03	4.8	YES	18	4.03	72.5	4.03	4.8	0.224	67	28
10021	36 8	0	B	227	3	7/16/96	PAUL LYONS	6:54	6:54	0	19038 16	19038.9	0	1	4	1	0			0			0.75	0.75	YES	6	0 75	4.5	0.75	0 75	0 125	68	29
10033	37	0	B	195	3	6/11/96	P MACINNES	5:55	5:58	0	16586.89	16588.1	0	2	3	0	0			0			1.2	1 2	YES	5	1.20	6.0	1.2	1.2	0 240	69	30
10102	39	1	B	232	4	6/12/96	PAUL LYONS	6:06	6:06	0	14564.58	14578.5	0	24	31	3	0	2	2	2	2		13.94	15.45	YES	66	13 94	920 0	13 94	15 45	0.211	70	31
10170	40	1	B	8740	3	6/13/96	PAUL LYONS	7:30	7:30		4896.67	4901.68	0	7	20	3	4	11		0	9		5.01	5.85	YES	54	5 01	270.5	5.01	5.85	0.093	71	32
10144	41	1	B	8741	3	6/6/96	P MACINNES	7:06	7:06	0	29117.13	29117.1	0	0	2	0	0	11		0			0	0	YES	13	0.00	0 0	0	0	0.000	72	33
10064	41	0	B	184	5	6/6/96	T WILKINS	20:00	20:00	0	13925.09	13926.8	0	2	4	0	0			2	3		1.7	1 8	YES	11	1.70	18.7	1.7	1.8	0.155	73	34
10063	41	0	B	8731	6	5/31/96	KEN TERRELL	7:24	7:24	0	18418.8	18421.7	0	3	6	0	6	10		0			2.88	3.6	YES	25	2 88	72.0	2.88	3.6	0.115	74	35
10087	42	0	B	8757	3	6/11/96	P MACINNES	6:40	6:40	0	5538.39	5543.73	0	5	16	2	0	13		4			5.34	4.5	NO	40	4.33	173 4			0 108	75	35
10008	42	1	B	219	4	6/12/96	T WILKINS	21:00	21:03	0	0	15581.5	0	6	2	1	0			4	4		15581.5	4.95	NO	17	4.77	81.1			0.280	76	35
10003	42.1	0	B	243	5	6/6/96	T WILKINS	14:03	14 05	0	0	14288.2	0	8	4	2	0	1		0	1		14288 2	5.1	NO	16	4.91	78.6			0.307	77	35
10133	43	1	D	121	3	6/11/96	PAUL LYONS	6:29	6:25		13411.41	13411 8	0	0	2	0	0			0			0.4	0	NO	2	0.00	0.0			0 000	78	35
10143	43	1	D	131	4	6/5/96	P MACINNES	13:44	13:44	0	947.56	982.91	0	19	13	5	0			3	2		35.35	13.05	NO	42	12 57	527 9			0.299	79	35
10039	43	0	D	115	4	5/29/96	T WILKINS	15:43	15:53	0	18593.05	18607.9	0	22	23	7	2	4		0	3		14.85	14.85	YES	61	14.85	905.9	14.85	14.85	0.243	80	36
10042	43	0	D	296	5	5/30/96	T WILKINS	15:09	15:09	4	92358.9	92368.2	0	13	8	4	3	1		0	2		9.3	9.3	YES	31	9.30	288.3	9.3	9.3	0.300	81	37
11209	43	0	D	301	6	8/15/96	L SULLIVAN		17:00	1	7131.74	7141.19	1	13	13	5	1	1		3	3		10 45	9.75	YES	39	10.45	407.5	10.45	9.75	0.268	82	38
10024	44 1	0	D	149	3	6/11/96	PAUL LYONS	6:59	6.59	0	8146.13	8147.78	0	3	4	0	2	4		0		2	1.65	2.4	NO	15	2.31	34.7			0.154	83	38
10051	45	0	D	291	6	6/14/96	T WILKINS	18:24	18:24	0	19056.1	19061.7	0	8	6	2	1			3			5.55	6.3	YES	20	5.55	111 0	5.55	6.3	0.278	84	39
10015	45	0	D	168	6	5/31/96	KEN TERRELL	8:27	8:27	3	1355.25	1355.85	0	2	3	0	0	2		0			0.6	1.2	NO	7	1.16	8 1			0.165	85	39
10132	46	1	B	188	4	6/12/96	PAUL LYONS	13:00	13:00	0	14471.07	14471.1	0	1	3	0	0			0			0	0.6	NO	4	0.58	2.3			0.144	86	39
10071	47	0	A	8946	4	6/10/96	R MATTULINA	17:40	17:42	0	231.67	239.17	0	7	11	2	0			0	1		7.5	4.5	NO	21	4.33	91.0			0.206	87	39
10014	48	1	B	8018	5	6/6/96	T WILKINS	14:30	14:30	0	0	0	0	0	1	7	0			0			0	1.05	NO	8	1.01	8 1			0.126	88	39
10009	49	1	D	135	2	6/10/96	T WILKINS	16:49	16:52	0	0	16266.5	2	7	24	2	0	4		6	5		16268 5	6.3	NO	48	6.07	291.3			0 126	89	39
10158	49	1	D	311	3	7/9/96	P MACINNES	17:13	17:13	1	6139.12	6144 97	1	4	8	2	0			10			6.85	5.7	NO	24	5.49	131.8			0.229	90	39
10083	49	0	D	95	4	6/12/96	PAUL LYONS	7:03	7:03	0	3407	3422.12	0	20	25	1	1	2		1	1		15.12	12.75	NO	51	12.28	626.3			0.241	91	39
10127	49	1	D	303	6	5/31/96	KEN TERRELL	6:00	6:00	0	18335 09	18339.8	0	10	9	1	0	1		3			4.66	7.05	NO	24	6 79	163.0			0.283	92	39
10036	49	0	D		6	5/25/96	KEN TERRELL	14:49	14:51	8	25453.59	25466.2	0	24	23	3	5	2		0	10		12.57	16.35	NO	67	15.75	1055.1			0.235	93	39
10089	51	0	B	238	5	6/13/96	PAUL LYONS	15:15	15:16	0	408.5	412.32	0	4	7	2	5	6		0	2		3.82	4.2	YES	26	3.82	99.3	3.82	4.2	0.147	94	40
10099	55	0	D	8006	5	6/19/96	CURTIS SMITH	20:50	20:51	0	5475.13	5482.33	0	12	6	0	0			0	1		7.2	7.2	YES	19	7.20	136.8	7.2	7.2	0.379	95	41
10162	57	1	A	290	3	6/11/96	CURTISS SMITH	6:56	6:57	0	26897.73	26906.7	0	15	22	0	0	10		0			9	9	YES	47	9.00	423.0	9	9	0 191	96	42
10081	57	0	A	8788	3	6/4/96	P MACINNES	11:27	11:27	0	1419.47	1423.07	0	9	10	4	0			1	1		3.6	6.3	NO	25	6.07	151.7			0 243	97	42
10020	57	0	A	290	3	6/11/96	CURTISS SMITH	8:01	8:01	0	26906.73	26908.1	0	14	15	0	10	8		0			1.4	11.4	NO	47	10.98	516.1			0.234	98	42
10057	57	0	A	8601	4	6/5/96	T WILKINS	15:36	15:36	0	9876.05	9882.5	0	9	20	5	1	3		0			6.45	6.45	YES	38	6 45	245.1	6.45	6.45	0.170	99	43
10122	59	1	A	8962	5	6/13/96	T WILKINS	15:45	15:45	0	2493.01	2498.72	0	6	12	5	8			0			5.71	6.75	YES	31	5.71	177.0	5.71	6.75	0.184	100	44
10090	59	0	A	368	5	6/13/96	PAUL LYONS	17:00	17:00	0	21434.13	21445.7	0	26	14	0	0	1		0	3		11.56	15.6	NO	44	15.03	661.1			0.341	101	44
10075	59	0	A	275	5	5/30/96	P MACINNES	15:00	15:00	0	25660.82	25664.7	0	8	5	3	2			0			3.92	5.85	NO	18	5.63	101.4			0.313	102	44
10030	60	0	A	302	5	6/19/96	CURTISS SMITH	23:30	23:32	0	3906.59	3906.59	0	0	3	0	0			0			0	0	YES	3	0.00	0.0	0	0	0.000	103	45
10044	60	0	A	8968	6	5/31/96	T WILKINS	11:50	11:50	0	98760.05	98763.1	0	5	6	0	0			0	1		3	3	YES	12	3.00	36.0	3	3	0 250	104	46
10161	64	1	A	8642	6	6/21/96	T PINAKAS	5:31	5:31	0	7522.2	7526.9	0	11	16	1	0			0			4.7	6.75	NO	28	6.50	182.0			0.232	105	46
10034	66 6	0	D	307	4	6/12/96	PAUL LYONS	14:20	14:20	0	3550.21	3554.14	1	9	5	0	3	1		0	1	1	4.93	6.3	NO	20	6 07	121.4			0.303	106	46
10012	66.6	1	D	299	4	5/29/96	T WILKINS	14:09	14:10	0	0	0	0	22	14	3	2			0	5		0	14.25	NO	46	13.73	631.4			0.298	107	46
10128	66.6	1	D	314	5	6/6/96	T WILKINS	19:10	19:14	0	97365.39	97381.8	0	25	32	3	2			1	3		16.4	16.35	YES	66	16.40	1082.4	16.4	16.35	0.248	108	47
10105	66.6	1	D	314	6	6/7/96	PAUL LYONS	6:40	6:40		26678.16	26684	0	8	16	1	4	60		1	2		5.79	6.45	YES	92	5.79	532.7	5.79	6.45	0 063	109	48
10167	69	1	C	87	4	6/12/96	CURTISS SMITH	7:41	7:50	0	29679.98	29682.4	0	8	25	0	0			0			2.4	4.8	NO	33	4.62	152.6			0 140	110	48
10092	69	0	C	397	4	5/29/96	PAUL LYONS	13:40	13:40	0	15072.99	15079.1	0	12	6	3	0	1		1			6.12	7.95	NO	23	7.66	176.1			0 333	111	48
10108	71	1	N		3	7/2/96	R MATTULINA	8:41	8:41	0	383.78	388.73	0	9	11	1	0			0			4.95	5.55	YES	21	4.95	104.0	4.95	5.55	0.236	112	49
10093	71	0	N	8016	3	6/11/96	CURTISS SMITH	6:17	6:19	0	22331.91	22339.7	0	13	19	0	0			0			7.8	7.8	YES	32	7.80	249.6	7.8	7.8	0.244	113	50
10159	71	1	N	50	4	6/12/96	CURTISS SMITH	8:27	8:27	0	6429.24	6431.04	0	10	28	0	0			0			1.8	6	NO	38	5.78	219.6			0.152	114	50
10049	72	0	N	4007	6	6/21/96	T WILKINS	21:40	21.40	0	69731.25	69734.7	0	4	6	1	0			3			3.45	3.45	YES	14	3.45	48.3	3.45	3.45	0.246	115	51
10050	73	0	N	40	5	6/6/96	T WILKINS	17:40	17:40	0	89727.05	89735.6	0	14	27	1	0			0	1		8.55	8.55	YES	43	8 55	367.7	8.55	8.55	0.199	116	52
10116	73.1	1	N	4039	6	6/14/96	T WILKINS	16:23	16:23	0	1920.02	1930.08	0	17	18	3	1			0	1		10.06	10.95	YES	40	10.06	402.4	10.06	10.95	0.251	117	53
10018	75	0	S	66	4	5/29/96	PAUL LYONS	14:40	14:42	0	21862.12	21863.1	0	7	6	2	2	4		0			1.01	5.1	NO	21	4 91	103.2			0.234	118	53
10163	77	1	S	8480	3	6/11/96	CURTISS SMITH	5:48	5:48	0	15329 6	15337.3	0	12	17	3	0			0			7.65	7.65	YES	32	7 65	244.8	7.65	7.65	0.239	119	54
10148	77	1	S	74	3	6/11/96	PAUL LYONS	9:50	9:50	0	1596.1	1605.1	0	12	12	4	6	9		0		2	9	9.6	YES	45	9.00	405 0	9	9 6	0.200	120	55
10097	77	0	B	4	3	7/9/96	P MACINNES	17:57	17:57	0	14996.75	15002.1	0	7	14	1	2			2		1	5.3	5.55	YES	27	5.30	143.1	5.3	5.55	0 196	121	56
10117	77	1	C	36	4	6/12/96	T WILKINS	15:50	15:50	0	73521.5	73527.7	0	8	11	5	2	3		0			6.15	6.15	YES	29	6.15	178.3	6.15	6 15	0 212	122	57
10098	77.3	0	S	12	6	5/24/96	CURTISS SMITH	7:38	7:38	0	17000.88	17001.6	0	2	5	0	0			0			0.7	1.2	NO	7	1 16	8.1			0 165	123	57
10139	79	1	S	342	5	5/30/96	T PINAKAS	12.45	12:45	0	2642.9	2649 3	0	4	13	0	2			10			6.4	6	YES	29	6.40	185.6	6.4	6	0 221	124	58
10076	79	0	S	342	5	5/30/96	T PINAKAS	13:05	13:05	0	2641.3	2643.6	0	3	11	0	2			5	1		2.3	3.9	NO	22	3.76	82 6			0.171	125	58
10084	80	0	C	86	3	6/11/96	PAUL LYONS	8:25	8:25	0	23625.08	23628	0	4	6	2	0	1		0			2.9	2.7	YES	13	2.90	37.7	2.9	2.7	0.223	126	59

Table B-7 (cont.)
Trip Sample Records and Statistical Calculations: Bus and Trackless Trolley

Rec No	Route	Dir.	Garage	Bus #	Day	Date	Surveyor	SchTime	AcTime	Rem.	CashBeg.	CashEnd	Bill	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	Transf	Short	A_free	N_free	Fare Box	FB Est	FB OK	PAX	Used FB	Cor.	Calc. of Fare Evation		Av FB	#	OK
10118	80	1	C	13	6	6/21/96	T WILKINS	20:30	20:30	0	5029.36	5032.86	0	5	4	0	0			1	1		3.5	3.3	YES	11	3.50	38.5	3.5	3.3	0.318	127	60
10153	83.1	1	S	66	5	6/20/96	CURTISS SMITH	17:30	17:30	0	23730.85	23734.7	0	9	4	1	1			0			3.8	5.85	NO	15	5.63	84.5			0.376	128	60
10062	85	0	C	8015	6	5/31/96	KEN TERRELL	11:00	11:03	0	12602.54	12614.1	0	1	3	0	0			0			11.54	0.6	NO	4	0.58	2.3			0.144	129	60
10011	85	1	S	8015	6	5/31/96	KEN TERRELL	11:20	11:20	0	12614.08	0	0	6	2	0	0			0			12614.1	3.6	NO	8	3.47	27.7			0.433	130	60
10010	85	1	S		6	5/31/96	KEN TERRELL	12:05	12:05	0	0	12607	0	1	3	1	0			0			12607	0.75	NO	5	0.72	3.6			0.144	131	60
10141	87.2	1	S	61	3	6/11/96	T R ENGEL	8:38	8:38	0	17022.42	17034.6	0	20	32	6	1			0			12.16	13.2	YES	59	12.16	717.4	12.16	13.2	0.206	132	61
10048	88	0	L	60	4	6/5/96	T WILKINS	20:50	20:50	0	6357.07	6362.57	0	8	6	1	1		1	0			5.5	5.25	YES	17	5.50	93.5	5.5	5.25	0.324	133	62
10123	90	1	C	399	4	6/12/96	T WILKINS	19:30	19:30	0	19217.75	19221.1	0	8	6	2	2			0			3.3	5.7	NO	18	5.49	98.8			0.305	134	62
10113	90	1	C	8481	5	5/30/96	L SULLIVAN	8:05	8:05	0	15405.51	15411.5	0	8	14	3	3	5		0			6	6.15	YES	33	6.00	198.0	6	6.15	0.182	135	63
10046	92.3	0	C	116	5	5/30/96	KEN TERRELL	7:40	7.40	0	15165.44	15178.4	0	21	8	1	0			0	1		12.95	12.75	YES	31	12.95	401.4	12.95	12.75	0.418	136	64
10061	92.3	0	C	67	6	6/7/96	T WILKINS	17:10	17:02	6	5932.06	5940.46	0	14	28	0	0			0			8.4	8.4	YES	42	8.40	352.8	8.4	8.4	0.200	137	65
10137	93.1	1	C	17	5	5/30/96	T PINAKAS	14:30	14:30	0	3652.4	3655.7	0	3	10	0	2	3		2	1		3.3	3	YES	21	3.30	69.3	3.3	3	0.157	138	66
10060	93.1	0	C	339	6	6/7/96	T WILKINS	14:39	14:44	4	93751.85	93761.8	0	14	9	6	2	8		0	2		9.9	9.9	YES	41	9.90	405.9	9.9	9.9	0.241	139	67
11210	94.1	1	F	8569	2	8/19/96	GENTHNER	8:38	8:38		27778.46	27780.4	0	3	16	1	0			0			1.95	1.95	YES	20	1.95	39.0	1.95	1.95	0.098	140	68
10017	95	0	F	8888	3	6/11/96	PAUL LYONS	17:15	17:15	0	7497.47	7498.87	0	5	8	1	0			0	1		1.4	3.15	NO	15	3.03	45.5			0.202	141	68
10134	95	1	F	386	5	7/11/96	PAUL LYONS	21:55	21:55	0	25421.18	25422.2	0	2	1	1	0			0			1.06	1.35	NO	4	1.30	5.2			0.325	142	68
10101	95	0	F	368	5	7/11/96	PAUL LYONS	21:30	21:30	0	25420.45	25421.2	0	3	7	0	0			1			0.73	2.1	NO	11	2.02	22.2			0.184	143	68
10171	101	1	F	8022	4	5/29/96	P MACINNES	7:30	7.30	0	20721.35	20731.3	1	20	33	3	2			0	1		10.93	13.05	YES	59	10.93	644.9	10.93	13.05	0.185	144	69
10088	104	0	C	375	5	6/20/96	T PINAKA	18.22	18:22	0	19344.2	19353.6	1	21	24	2	2			0			10.4	13.5	NO	49	13.00	637.2			0.265	145	69
10112	104	1	C	369	6	5/25/96	K TERRELL	13:25	13:25	1	16908.63	16920.9	0	25	14	3	0	1		0	5		12.24	15.45	NO	48	14.88	714.3			0.310	146	69
10126	105	1	C	8013	6	6/7/96	T WILKINS	16:00	16:03	0	1821.81	1828.81	0	7	12	5	3			1	1		7	6.15	NO	29	5.92	171.8			0.204	147	69
10027	105	0	F	8013	6	5/25/96	KEN TERRELL	12:35	12:35	0	1103.44	1104.5	0	9	7	5	0			0	8		1.06	6.15	NO	29	5.92	171.8			0.204	148	69
10047	109	0	C	223	5	5/30/96	KEN TERRELL	6:41	6:41	0	31303.42	31309.6	0	16	12	0	1			0			6.14	9.9	NO	29	9.54	276.5			0.329	149	69
10136	109	1	C	38	6	6/7/96	T PINAKAS	7:23	7:23	0	6628.7	6636.2	1	20	25	7	7	4		3			8.5	16.05	NO	66	15.46	1020.3			0.234	150	69
10110	112	1	C	33	3	6/11/96	TR ENGEL	12:40	12:40	0	874.32	886.32	0	22	9	8	1	1		1			12	15	YES	42	12.00	504.0	12	15	0.286	151	70
10145	112	1	C	57	4	6/12/96	PAUL LYONS	8:06	8:06	0	1102.06	1110.09	0	16	14	3	0			0	1		8.03	10.05	NO	34	9.68	329.1			0.285	152	70
10096	112	0	C	345	4	7/10/96	P MACINNES	18:40	18:40	0	709.87	715.27	0	8	10	1	0			5	1		5.4	6.45	YES	25	5.40	135.0	5.4	6.45	0.216	153	71
10040	112	0	C	335	4	5/29/96	T WILKINS	12:20	12:22	0	18931.85	18944.1	0	19	14	5	1			1	3		12.2	12.75	YES	43	12.20	524.6	12.2	12.75	0.284	154	72
10094	112	0	C	6065	6	6/21/96	T PINAKA	7:22	7:22	0	6563.8	6569.9	0	18	22	2	3	1		0			6.1	12	NO	46	11.56	531.7			0.251	155	72
10169	137	1	F	664	6	6/21/96	T PINAKAS	18:30	18:30		12624.8	12645.7	1	21	27	1	0	3		0			21.9	17.05	NO	52	16.42	854.0			0.316	156	72
10157	211	1	Q	8433	6	7/19/96	P MACINNES	17:30	17:30	0	9796.03	9797.23	0	2	1	0	0			0			1.2	1.2	YES	3	1.20	3.6	1.2	1.2	0.400	157	73
10045	216	0	Q	8821	5	5/30/96	KEN TERRELL	10:40	10:42	0	23543.97	23545.3	0	2	0	1	0	1		0			1.35	1.35	YES	4	1.35	5.4	1.35	1.35	0.337	158	74
10054	220	0	Q	8829	4	6/14/96	KEN TERRELL	21:00	21:00	0	32659.28	32678.8	0	7	13	1	0			0			19.52	4.35	NO	21	4.19	88.0			0.200	159	74
10155	220	1	Q	8810	5	7/11/96	P MACINNES	17:15	17:15	0	21414.16	21419.7	0	7	5	0	0			3			5.5	5.1	YES	15	5.50	82.5	5.5	5.1	0.367	160	75
10109	225	1	Q	8542	6	7/19/96	GENTHNER	8:05	8:08	0	479.04	482.79	0	5	11	0	0			4			3.75	4.2	YES	20	3.75	75.0	3.75	4.2	0.188	161	76
10104	225	1	Q	8822	6	7/19/96	GENTHNER	5:20	5:24	0	16088.21	16091.8	0	6	3	0	0			0			3.6	3.6	YES	9	3.60	32.4	3.6	3.6	0.400	162	77
10025	230	0	Q	8815	6	7/19/96	P MACINNES	18:10	18:10	0	20228.25	20228.9	0	1	16	1	0			1			0.65	1.45	NO	19	1.40	26.5			0.074	163	77
10168	230	1	Q	8810	5	7/11/96	P MACINNES	18:35	18:35	0	21424.27	21424.3	0	0	0	0	0			0			0	0	YES	0	0.00	0.0	0	0	0.000	164	78
10002	236	0	Q	8805	5	5/30/96	KEN TERRELL	11:40	11:40	0	0	0	0	7	4	3	0			0	2		0	4.65	NO	16	4.48	71.7			0.280	165	78
10070	238	0	Q	8442	3	7/2/96	R MATTULINA	6:25	6:26	0	908.9	918.1	0	9	10	3	0			1	1		9.2	6.15	NO	24	5.92	142.2			0.247	166	78
10107	240	1	Q	8442	3	7/2/96	R MATTULINA	7:00	7:00	7	918.1	928	0	17	17	0	0			3			9.9	14.8	NO	37	14.26	527.4			0.385	167	78
10103	240	1	Q	8821	3	6/11/96	TR ENGEL	16:50	17:04	20	31.71	39.63	0	13	5	2	1			0			7.92	11.25	YES	21	7.92	166.3	7.92	11.25	0.377	168	79
10072	240	0	Q	8804	3	6/11/96	TR ENGEL	16:20	16:20	0	38	42.55	1	15	14	2	1			1	1		10.55	13.25	YES	34	10.55	358.7	10.55	13.25	0.310	169	80
10006	246	0	Q	8810	3	6/11/96	T WILKINS	16:00	16:03	0	0	18713.5	0	4	5	5	0			1	1		18713.5	3.45	NO	16	3.32	53.2			0.208	170	80
10066	301	0	A	8901	5	6/13/96	T WILKINS	17:12	17:12	0	19725.3	19738.8	0	9	27	0	0			0			13.5	13.5	YES	36	13.50	486.0	13.5	13.5	0.375	171	81
10056	304	0	A	8948	4	6/5/96	T WILKINS	17:06	17:06	0	1094.31	1102.31	1	6	16	1	0			0			9	9.75	YES	23	9.00	207.0	9	9.75	0.391	172	82
10124	304	1	A	8778	4	6/5/96	T WILKINS	19:48	19:55	0	98763.05	98764.6	0	1	5	0	0			0			1.5	1.5	YES	6	1.50	9.0	1.5	1.5	0.250	173	83
10154	325	1	A	8837	5	6/20/96	T PINAKAS	17:24	17:24	0	6895.32	6899.4	0	10	15	3	0			0			4.08	17.25	NO	28	16.62	465.2			0.593	174	83
10022	352	0	A	353	6	6/1/96	T WILKINS	18:20	18:21	0	75310.5	75315	0	2	13	0	0		5	0			4.5	4.5	YES	20	4.50	90.0	4.5	4.5	0.225	175	84
10078	426	0	L	8868	4	5/29/96	P MACINNES	11:30	11:30	0	27648.49	27657.7	3	6	4	3	0			4		1	12.19	11.6	YES	18	12.19	219.4	12.19	11.6	0.677	176	85
10131	426	1	L	8225	5	6/6/96	T PINAKAS	7:30	7:30	0	6241.1	6248.7	0	18	30	6	3	5		5			7.6	30.4	NO	67	29.28	1961.8			0.437	177	85
10095	426	0	L	8842	6	6/21/96	T PINAKAS	8:50	8:50	0	13241.2	13248.3	0	13	22	2	1	2		0			7.1	18.15	NO	40	17.48	699.3			0.437	178	85
10074	450	0	L	8425	5	5/30/96	T PINAKAS	15:40	15:40		4426.5	4434.6	0	15	18	3	4	1		2	2		8.1	25.75	NO	45	24.80	1116.1			0.551	179	85
10037	468	0	L	8455	3	6/4/96	L SULLIVAN	8:00	8:00	0	28396.61	28398.7	0	3		0	1			0			2.05	2.1	YES	4	2.05	8.2	2.05	2.1	0.512	180	86
10125	CT1	1	A	269	5	6/6/96	T WILKINS	12:30	12:30	0	12348.23	12349.8	0	2	2	0	0	1		0	2		1.55	1.2	NO	7	1.16	8.1			0.165	181	86
10055	CT1	0	A	8951	4	6/19/96	CURTISS SMITH	16:00	16:00	0	2542.1	2544.5	0	4	5	0	0			0	1		2.4	2.4	YES	10	2.40	24.0	2.4	2.4	0.240	182	87
10135	CT1	1	A	8244	6	6/7/96	T PINAKAS	8:45	8:45	0	7645	7654.3	0	16	17	5	4	3		3			9.3	12.45	NO	48	11.99	575.6			0.250	183	87
10119	CT1	1	A	8918	6	6/14/96	T WILKINS	17:30	17:33	0	6774.27	6784.07	0	16	11	1	0			2			9.8	10.35	YES	30	9.80	294.0	9.8	10.35	0.327	184	88
10077	CT2	0	A	8966	6	6/14/96	VICI	11:10	11:10	0	6762.35	6763.35	2	1	3	1	0			0			3	0.75	NO	5	0.72	3.6			0.144	185	88
10106	CT3	1	A	8953	3	6/4/96	P MACINNES	13:15	13:15	0	5213.52	5213.72	0	2	1	1	2			0			0.2	1.95	NO	6	1.88	11.3			0.313	186	88
10175	1	0	D	315	7	6/22/96	P MACINNES	6:10	6:10	0	2636.16	2645.61	0	12	6	0	0			5			9.45	8.7	YES	23	9.45	217.4	9.45	8.7	0.411	187	89
10184	17	1	D	66	7	6/22/96	T PINAKAS	11:50	11:50	0	22525.3	22533.4	0	13	12	1	0	2		0			8.1	7.95	YES	28	8.10	226.8	8.1	7.95	0.289	188	90
10194	23	1	D	315	7	7/20/96	PAUL LYONS	8:20	8:20		0	0	0	9	13	2	6			6	1	5	0	9.3	NO	42	8.96	376.2			0.213	189	90

Table B-7 (cont.)
Trip Sample Records and Statistical Calculations: Bus and Trackless Trolley

Rec. No.	Route	Dir.	Garage	Bus #	Day	Date	Surveyor	SchTime	AcTime	Rem.	CashBeg.	CashEnd	Bill	Ad. Cash	Ad. Pass	Red.	St. 1/2	St. Pass	Transf	Short	A_free	N_free
10177	23	0	D	296	7	6/15/96	T WILKINS	14:08	14.08	0	36492	36502.4	0	12	11	4	6			3		1
10172	31	0	B	745	7	6/29/96	T PINAKAS	11:19	11:19	0	14321.4	14326.2	0	9	12	3	2			0		
10193	39.3	1	B	237	7	6/15/96	T WILKINS	20:14	20:16	0	29735.68	29749.8	0	19	23	3	1			6	3	
10187	42	1	B	251	7	6/22/96	P MACINNES	17:57	17:57	0	1654.43	1654.43	0	5	4	1	0			6	5	
10176	42	0	B	219	7	6/22/96	P MACINNES	17:14	17:14	0	15630	15632.2	0	2	8	0	1			3		
10181	43	0	D	174	7	6/29/96	T WILKINS	0:12	0:12	0	7956.33	7961 95	0	3	4	0	0			11	1	
10180	43	0	D	174	7	6/29/96	T WILKINS	23:01	23:01	0	9923 15	9924.35	0	2	6	0	0			0		
10188	45	1	L	8855	7	6/15/96	T PINAKAS	12:20	12:20	0	6261.5	6267.6	1	20	28	1	4	2		0	1	
10173	45	0	L	8855	7	6/15/96	T PINAKAS	11:30	11.30	0	6255.2	6261.5	1	18	21	2	4			0		
10189	45.5	1	L	8874	7	6/22/96	P MACINNES	8:30	8:30	0	4225.89	4250 53	2	21	8	4	0			3	1	
10178	46	0	B	8648	7	6/15/96	T WILKINS	15:15	15:16	0	10932.05	10934.5	0	3	4	2	1			0		
10182	47	0	D	30	7	7/27/96	L SULLIVAN	7:00	7:00		11140.15	11144 1	0	4	8	1	2			2		
10186	57	1	A	8645	7	6/29/96	T PINAKAS	9:35	9.35	0	3742.3	3748 4	0	13	19	2	4			0		
10183	62.3	0	S	324	7	7/28/96	L SULLIVAN	17:00	17:00		27115.63	27122	1	5	4	4	0			0		
10179	66 6	0	D	286	7	6/15/96	T WILKINS	16:00	16:02	0	56793.06	56808.9	0	22	23	6	3			3	6	
10191	77	1	S	326	7	6/15/96	T WILKINS	18:40	18:40	0	19510.46	19514.8	0	6	16	3	1			0		
10185	77	1	S	8655	7	6/22/96	T PINAKAS	9:42	9:42		6255.7	6266.7	1	14	16	2	1	2		0		
10195	78	1	S		7	7/20/96	PAUL LYONS	6:40	6:40		6434.1	6440.11	1	7	4	4	5	3		2	3	
10192	88	1	S	361	7	6/29/96	T WILKINS	21:40	21.41	0	8732.19	8738.93	0	9	4	3	0			0		
10190	130	1	F	381	7	6/22/96	P MACINNES	15:45	15:45	0	16749.72	16749 7	0	0	0	0	0			0		
10174	435	0	L	8579	7	6/22/96	P MACINNES	10:30	10.20	0	5984.31	5998.26	0	22	2	13	0			1	5	
												Sum		2112	2474	423	252	358	12	278	232	22
												6163	%	0.343					0.002	0.045	0.038	0.004
													%	0.388	0.401	0.069	0.041	0.058			0.043	

Fare Box	FB Est.	FB OK	PAX	Used FB	Cor.	Calc. of Fare Evation		Av. FB	#	OK
10.35	10.5	YES	37	10.35	382.9	10.35	10.5	0 280	190	91
4.8	6 45	NO	26	6.21	161.5			0 239	191	91
14.15	13.95	YES	55	14 15	778 3	14.15	13 95	0 257	192	92
0	4.95	NO	21	4 77	100 1			0.227	193	92
2.22	2.4	YES	14	2.22	31 1	2 22	2 4	0 159	194	93
5.62	5.1	NO	19	4 91	93 3			0.259	195	93
1.2	1 2	YES	8	1 20	9 6	1.2	1.2	0 150	196	94
7.1	13.35	NO	56	12.86	720 1			0.230	197	94
7.3	12.3	NO	45	11.85	533 1			0.263	198	94
26.64	14.1	NO	37	13.58	502 5			0.367	199	94
2.4	2.4	YES	10	2.40	24.0	2.4	2.4	0 240	200	95
3.95	3.75	YES	17	3 95	67.2	3.95	3.75	0 232	201	96
6.1	9.3	NO	38	8.96	340.4			0.236	202	96
7.36	5	NO	13	4 82	62.6			0.370	203	96
15.85	15.9	YES	63	15.85	998.6	15.85	15.9	0.252	204	97
4.35	4.35	YES	26	4.35	113.1	4.35	4.35	0.167	205	98
12	9	NO	35	8 67	303.4			0.248	206	98
7.01	6.9	YES	28	7.01	196.3	7.01	6.9	0.250	207	99
6.74	5.85	NO	16	5.63	90.2			0.352	208	99
0	0	YES	0	0.00	0.0	0	0	0.000	209	100
13.95	21.25	NO	43	20.47	880.1			0 476	210	100
						695.86	722.45	N:	210	100
						3.68 %		% OK:	48	%

Week:							
Mean	29 3	7.31156	0.2491				
STDEV	18.8	5.60677	87.091				
COV	0.64	0 76684	0.05				
Tolerance	8.6	10 372	0.83				

Summary	total	WK	WE
PAX	6163	5040	1123
FB	1535.429	1254.832	283.887
Av. FB	0.2491	0.2490	0.2528
Precision	10.41949	12.0506	19.0769

Sum		1735	1977	337	196	347	12	218	202	16	
5040	%	0.344					0.002	0.043	0.040	0.003	
	%	0.388	0.392	0 067	0.039	0.069			0.046		

Wkday:						
Mean	29.3	7.29553	0.2490	600.73	627.5	N: 172 85
STDEV	19.8	5.82618	95.39	4.27 %		% OK: 49 %
COV	0.7	0.7986	0.06			
Tolerance	9.1	10.801	0.83			

Sum		377	497	86	56	11	0	60	30	6	
1123	%	0.336					0.000	0.053	0.027	0.005	
	%	0.389	0.443	0.077	0.050	0.010			0.032		

Wkend:						
Mean	29.6	7.47	0.2528	95.13	94.950	N: 38 16
STDEV	13.5	4.5593	50.93	-0.19 %		% OK: 42 %
COV	0.46	0.61029	0.097			
Tolerance	6.18	8.25434	0.827			

Table B-8
Statistical Calculations of Weekly Passenger Boardings, True Average Fare and Average Pass Ride Value by Mode

	BUS	TROLLEY	Bus & Trackless Trolley	Surf. GL	Subw. GL	Rapid Transit	TOT. RAIL	Pass
Jul-95	1,955,915	56,230	2,012,145	606,472	1,392,390	3,356,137	4,748,527	4,839,958.00
Aug-95	2,007,230	67,488	2,074,718	617,303	1,271,503	3,515,948	4,787,451	4,869,189.00
Sep-95	1,875,032	58,714	1,933,746	672,032	1,454,625	3,293,569	4,748,194	5,115,013.50
Oct-95	1,963,325	97,812	2,061,137	643,759	1,405,423	3,265,544	4,670,967	5,447,423.00
Nov-95	1,787,038	52,476	1,839,514	524,101	1,253,937	3,052,299	4,306,236	5,474,505.00
Dec-95	1,845,111	60,381	1,905,492	494,778	1,187,946	2,967,312	4,155,258	5,222,718.00
Jan-96	2,079,789	57,217	2,137,006	533,244	1,255,669	3,168,354	4,424,023	5,062,982.13
Feb-96	1,840,791	60,237	1,901,028	631,989	1,134,193	2,837,334	3,971,527	5,486,593.06
Mar-96	1,927,036	58,680	1,985,716	542,886	1,207,229	3,042,952	4,250,181	5,424,205.07
Apr-96	1,961,192	59,538	2,020,730	539,541	1,360,729	3,157,383	4,518,112	5,435,707.90
May-96	1,919,484	68,712	1,988,196	565,158	1,304,955	3,214,066	4,519,021	5,031,448.00
Jun-96	1,836,771	69,886	1,906,657	505,248	1,328,903	3,291,508	4,620,411	5,030,352.00
SUM of Revenue	22,998,714	767,371	23,766,085	6,876,511	15,557,502	38,162,406		
Token Revenue			241,379	2,175,600				
Total FB Revenue			24,007,464	9,052,111	14,443,310	36,859,620		
Pass Revenue			18,901,230	9,326,057		30,316,703		

	Bus & Trackless Trolley	Surf. GL	Subw. GL	Rapid Transit	Light Rail	Heavy Rail
Avg. FB Deposit	0.2491	0.322	0.533	0.458		
unweighted				0.478		
weighted				0.477		
Subw. GL/RT Split			0.783042621	0.216957379		
PAX	1,853,128	539,995	521,178	1,546,459	948,099	1,659,533
unweighted				2,064,196		
weighted				2,067,637		
True Av. Fare	0.4453				0.602	0.815
Av. Pass Fare	0.4891				0.691	0.828

Appendix C:
Further Statistical Issues

POSSIBLE SOURCES OF BIAS

Every statistical analysis has to deal with bias caused by random and/or systematic errors. There are several sources of errors possible:

Sampling Errors: It is possible that the sample does not reflect the population, resulting in differences of sample and population characteristics. Sampling errors can occur if:

- the sample size is too small for catching the variation of the population
- the population has cluster characteristics, but is not accordingly sampled
- the stratification process has problems
- checkers introduce a trip and/or car selection bias, which can happen in the case of the Green Line

Surveying Errors: Both revenue and passenger count data can be inaccurate for reasons described above. Revenue data can be under as well as overestimated, because of measurement error or real fare evasion, whereas passenger figures just tend to be undercounted.

Analysis Errors: Assumptions (such as for weighting weekday and weekend results for the total week figure) can be not exact enough, or expansion factors based on internal ridership estimations can be inaccurate because of sampling and/or surveying errors.

FUTURE IMPROVEMENTS FOR SAMPLING AND SURVEYING

1. The following sampling improvements are possible:

- The sample of rapid transit stations should be stratified by light and heavy rail stations, low and high volume, as well as weekday and weekend.

- Surveying the surface Green Line outbound should always start at Kenmore station and the sample should be stratified by time (no increased density within certain time periods). Car selection bias can be reduced with teams of four and trip selection bias can be controlled through better supervision.

- The sample size should be increased for the weekend.

- Zoned buses, express buses, trolleys and local buses should be stratified.

2. The following surveying improvements are possible:

- All bus and surface Green line survey forms should have a separate field for passengers paying with tokens.

- There should be different forms for each Green line branch, not only for the D-Line (because surveyors are not used to it and take regular forms for surveying the D-line).

- Reservoir and Lechmere trips must better sampled (i.e. through supervision).

- The time period of surveying rapid transit stations has to be exactly followed (because of internal expansion) and controlled through better supervision. However, it is enough to survey only a $^1/_2$ hour time period.